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HALLUCINATIONS AND ILLUSIONS.

HALLUCINATIONS AND ILLUSIONS

A STUDY OF THE

FALLACIES OF PERCEPTION

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PREFACE.

THIS book originated in an examination, upon which I was recently engaged, of the "International Census of Waking Hallucinations in the Sane."

While comparing for this purpose all the works accessible to me on hallucination and fallacious perception in general, I was struck by the fact that the writers, and especially the more modern writers, treat for the most part only of single aspects of the subject, such as fallacies of perception occurring under morbid conditions, or in dreams, throwing at most but a casual glance at related phenomena. The waking hallucinations of healthy persons are more or less completely ignored by them; and this neglect is natural enough, if we consider how meagre are all the accounts of such phenomena hitherto published.

But now that the inquiry originated by the International Congress of Psychology at its meeting in Paris in 1889 has furnished ample and trustworthy data, it seems possible to bring these particular phenomena of fallacious perception into line with the rest. Moreover, as this subject has already been dealt with at the Congress held in London in 1892, and will

doubtless form part of the proceedings of subsequent congresses, it seems to me that it may not be superfluous as a preliminary inquiry to review the whole field of sensory delusion, to indicate its relations to normal or "objective" perception, and to elucidate the common organic principle which, under whatever diversity of conditions, underlies alike normal and fallacious perception.

In the course of such an undertaking it is impossible to avoid supplementing by hypotheses our scanty knowledge of physiology and the localisation of cerebral functions. I have endeavoured, however, where practicable, to make good this deficiency, and have sought by an exhaustive study of the German, English, French, and American literature of the subject to establish my conclusions on a thoroughly broad basis. In doing this I have not depended on the more recent cases only, but have carried my researches as far back as the early part of the century, and thus rescued from oblivion many forgotten observations.

On the other hand, the collected results of the "International Census of Waking Hallucinations in the Sane" furnish fresh material not yet critically handled or presented in literary form; at all events, a short note on the subject in F. C. Müller's *Handbuch der Neurasthenie* is all I have been able to find. The statistics in question, with the exception of those of the Munich Collection, have, it is true, been submitted to the London Congress, but they have not

hitherto been published. I take this opportunity to thank the Society for Psychical Research and the Munich Psychologische Gesellschaft for the permission which they have kindly granted me to publish them here. Indeed, the completion of my work, which grew out of a series of lectures delivered before the Munich section of the Gesellschaft für Psychologische Forschung, has been rendered possible only by the sympathy and interest which the members of that society accorded to me. I feel myself indebted to them all, but more especially to Baron von Schrenck-Notzing (Munich), Dr. F. C. Müller (Alexandersbad), Dr. Max Dessoir (Berlin), and Dr. Burckhardt-Préfargier, for the constant stimulus of their sympathetic interest, and the help they have kindly given me in collecting material and in reading the proof-sheets.

EDMUND PARISH.

MUNICH, *April* 1894.

PREFACE TO THE ENGLISH EDITION.

THE English edition is not a mere translation of the German original. In the first place, I have been at some pains to render it generally more complete and bring it up to date; and, moreover, as fuller particulars of the "International Census of Waking Hallucinations" have been published since the appearance of the original edition, it has been necessary to recast the chapters dealing with that subject, and in the process of recasting them I have not neglected to profit by the hints and objections of my critics. Finally, a new chapter has been added, in which an attempt is made to enlarge the scope of the work and to indicate the relation of the views set forth to psychology in general. I trust that the book in its new form may meet with as kindly a reception as on its first appearance.

E. P.

MUNICH, *April* 1897.

CONTENTS.

CHAPTER I.

PAGE

INTRODUCTION 1

Definition—Universal Fallacies of Perception—Due to Ambiguity of the Stimuli—Arising out of Defects or Pathological States of the Organism—The "Feeling of Unity" conditioned by "Eccentric Projection"—Psychological Conception of False Perception—Criticism of the Definition that Hallucination is Ideation equalling Sensation in Vividness—Hallucination is Sensory Perception.

CHAPTER II.

FALLACIOUS PERCEPTION IN VARIOUS PATHOLOGICAL AND PHYSIOLOGICAL STATES 18

Esquirol's distinction between Hallucination and Illusion—Fallacies of Perception in the Insane: In Amentia, Dementia, Melancholia, Mania, *Folie Circulaire*, Delusional Insanity and Paranoia, General Paralysis—The share of the several Senses in these Delusions, and their effect on the Patient—In Psychoneuroses: Epilepsy, Hysteria—In Ecstasy—In States of Intoxication: Alcohol, Chloroform, Ether, Haschisch, Santonin, Cinchona, Opium, Nitrous Oxide Gas—Specific Action of Narcotics and Personal Reaction—In acute Somatic Diseases—In Dreams—In Hypnosis—Crystal Visions—Dissociation of Consciousness the Common Characteristic of all these States.

CHAPTER III.

PAGE

WAKING HALLUCINATIONS AND THE RESULT OF THE INTERNATIONAL CENSUS 77

Early Accounts—The International Census—General Results—Sex, Age, Nationality, and State of Health of the Percipients—Their so-called "Waking" State really one of Dissociation—Indications of this in the Narratives—Why such Indications are sometimes wanting—Hallucinations classified according to the Sense affected—The less startling Hallucinations are soon forgotten.

CHAPTER IV.

THE PHYSIOLOGICAL PROCESS IN FALLACIOUS PERCEPTION 110

Early Attempts at Explanation—The Centrifugal Psychic Theories—Objections—The Centrifugal Sensorial Theories—The Conception underlying all Centrifugal Theories—Arguments against this Conception—Centripetal Theories—Identity of the Sensory and Ideational Centres—Theories of Pelman and Kandinsky—False Perception a Phenomenon conditioned by disturbed Association—Meynert—James—Explanation suggested by the Author—Its Advantages—Schematic Presentation of the Physiological Process in False Perception—Various Objections met.

CHAPTER V.

THE FACTORS OF FALLACIOUS PERCEPTION ... 152

The dissociated State—Definition—Pathological and Physiological Causes—Varieties of Dissociation—Action of Dissociation—The Stimuli—*Post-mortem* Reports—Excitation of the various Senses—Cramer's Theory.

CHAPTER VI.

PAGE

THE CONTENT OF FALLACIOUS PERCEPTION ... 185

The Content dependent (1) on Memory and Experience—(2) On the Conditions which induce the Hallucinated State—(3) On the Temperament and Mental Environment of the Individual—(4) On the Brain-state which obtains at the Moment (Exhaustion, Concentration, Emotions, Subconscious Processes)—(5) On the Sensory Stimuli.—Explanation of some Facts generally misinterpreted—(1) Certain phenomena usually cited in support of retinal participation—(2) Negative Hallucinations—The Phenomena and Nature of *Rapport*—Negative Hallucinations not explained by diversion of attention—Their true Nature.

CHAPTER VII.

THE INITIATION OF FALLACIOUS PERCEPTION ... 221

The Problem: How are Reflex Hallucinations to be accounted for?—(1) Synæsthesia, (2) Hallucinations of Memory, as possible explanations—Author's attempt to explain them by distinguishing between the preparatory and the starting Factor—A New Conception of the *Point de Repère*.

CHAPTER VIII.

THE MANIFESTATIONS OF FALLACIOUS PERCEPTION 236

Various Degrees of Distinctness in Sensory Phantasms—Percipient's Attitude—Sensory Character of the Phenomena not disproved by a certain feeling of Subjectivity—Attempts to explain "Audible Thinking"—Automatic Articulation—Spontaneous Cases—Experimental Evidence.

CHAPTER IX.

PAGE

TELEPATHIC HALLUCINATIONS 272

Results of the International Census—Various sources of error: (1) Hallucinations of Memory, (2) Reading back of details after the event, (3) Exaggeration of the Coincidence—Comparison between Coincidental and Non-Coincidental "Waking" Hallucinations misleading—Indications of Dissociation in the Death-Coincidences of the Report—Association of Ideas not to be ignored—Other proofs of Telepathy Criticised—Alleged special characteristics of "Telepathic" Hallucinations.

CHAPTER X.

SUMMARY AND CONCLUSION 321

Recapitulation of Argument—All Hallucinations conditioned by Dissociation—Objection to Physiological Explanations from standpoint of Psychology—Criticism of Psychological Position—The Physiological Scheme provisional—Bearings of this Study on Theories of Perception generally.

APPENDIX 343

HALLUCINATIONS AND ILLUSIONS.

Hallucinations and Illusions.

CHAPTER I.

INTRODUCTION.

Definition—Universal Fallacies of Perception—Due to Ambiguity of the Stimuli—Arising out of Defects or Pathological States of the Organism—The "Feeling of Unity" conditioned by "Eccentric Projection"—Psychological Conception of False Perception—Criticism of the Definition that Hallucination is Ideation equalling Sensation in Vividness—Hallucination is Sensory Perception.

WHILST in general our sensory perceptions may be shared by all persons with normal senses, there are some cases which form an exception to this rule.[1] Perceptions of the first class are described as "objective," those of the second class as "subjective," that is to say, as lacking an external objective basis. Subjective perceptions are variously known as hallucinations, illusions, dream images, fallacious perceptions, and so on.

It is important at the outset of such an inquiry to grasp the difference between sensory and mental delusions. In sensory deceptions the subject not only imagines something, but believes that he sees or

[1] Gurney, "Hallucinations," *Proceedings of the Society for Psychical Research*, 1885.

hears that something—in fact, that he perceives it with his senses. Of course the observer is liable to be misled by the expressions of the patient, whose loose use of words may lend his *délire*, or mental delusion, the guise of a sensory impression. But a somewhat closer analysis will serve to make the distinction clear. When, for instance, a patient with peritonitis[1] declares that a church congress is being held inside her, and says that she can "feel it" and so on, that is a mental delusion, originating in certain localised sensations in the abdomen, and not a fallacy of perception, for no one knows what a congress in such a locality would feel like. But should a further development take place, and the patient imagine that she hears the speeches and arguments of the contending parties in the congress, we then of course have an auditory hallucination. A similar case is that of the paralytic who imagined in persistent constipation that he carried the child of the Grand Duke of Baden within his body, and insisted that he would have to be delivered. Many such cases, as for instance those which result from tabes, as well as similar phenomena observed in hypochondriasis, are to be reckoned not as sensory hallucinations, but as false inferences (Hoppe[2]) or as mental delusions[3] (Westphal[4]).

[1] Leuret, quoting Dagonet, *Traité des maladies mentales.*

[2] Hoppe, *Erklärung der Sinnestäuschungen bei Gesunden und Kranken.*

[3] The term "Sinnestäuschung" (sensory fallacy) has been regarded as misleading by L. Meyer, "Ueber den Charakter der Hallucinationen von Geisteskranken," in the *Centralbl. f. d. med. Wissensch.* (1865), No. 43, and before him by Hecker, *Ueber Visionen* (1848), by the latter from an objection, based on a confusion of physiological and psychological grounds, that the senses do not err, but that what is faithfully transmitted by them is falsely interpreted (compare Goethe, "Die Sinne trügen nicht, aber das Urtheil trügt;" Michéa, *Du délire des*

Universal Fallacies of Perception.—By the foregoing preliminary definition of fallacious perception we have excluded from the outset those sensory delusions which, by reason of their objective foundation and the nature of our sense organs, are experienced normally and necessarily by all persons.[1] To this class belong phenomena like the *fata morgana*, the spectre of the Brocken, the illusion of "a straight stick bent in a pool," the doubling of an object seen through a prism, or by pressure on the eyeball causing divergence of the axes of vision. Anomalous functioning of the accommodation muscles of the eye can produce the same result as that artificially induced by the means just described, as we see in diplopia.[2] Or again in diplopia monocularis, functional

sensations (1846): "c'est l'esprit qui se trompe, non pas l'organe sensorial;" and the same is to be found in Aristotle). But this is not so simple as it seems. A patient who imagines he is pursued, and who on hearing the sound of water dropping (compare Sander's article, "Sinnestäuschungen," in the *Real-Encyklopädie*, XVIII.), says, "Hark! they are outside, they are trying to bribe the keeper with gold," is suffering from a mental delusion; but in the case of a patient who declares he hears, not the sound of water dropping but the clink of gold being counted out, a fallacy of sense-perception may be presumed. On the whole, it seems to me that the term "false perception" (*Trugwahrnehmung*) is the best general term. [4] Westphal in *Arch. f. Psych.*, i. p. 48.

[1] Blumröder in *Schmidt's Jahrb.*, xlviii. p. 368.

[2] For examples see *Weitenweber's Beitr.*, iv. 1; Lochus, "Einige prakt. Bem." in *Schweiz. Zeitschr.*, iii. 2; A. Huck, "Ueber die Täuschungen," etc., in *Müller's Arch. f. Anatomie*, 1840, No. 1; Meyer, "Ueber einige Täuschungen" in *Arch. f. d. physiol. Heilk.*, 1842, Heft 1; Guépin in *Ann. d'Oc.*, xliii., Febr.-March, 1860; M. Benedict in *Arch. f. Ophthalm.*, x. 1, pp. 97 *et seq.*, 1864. In active squinting the second image is wanting, in passive (paralytic) squinting it is present. Its absence in the first case is explained by the fact that the active squinter has gradually learned to suppress the second image—or rather that use has altered the mutual relation between the two retinæ. Compare A. Graefe in vol. vi. of his Collected Works, where he

nerve disturbances of a hysterical nature may result in failure of accommodation, causing the double image, which is normally formed by the lens, to be distinctly developed on the retina as two separate images, and so penetrate to the percipient's consciousness.[1]

For the rest it will suffice here to note briefly the most familiar of the normal sensory delusions, such as the apparent movement of the sun round the earth, the apparent sinking down of the earth observed by balloonists, the flying past of trees, telegraph-posts, etc., and the rhythmic rising and sinking of the telegraph wires during a railway journey, the alteration in the size of the moon according to its position in the sky, the apparent smallness of houses near the line, seen out of a

shows how the seemingly lost second image may be raised again into consciousness. Compare also A. Dehennes in *Gaz. des Hôp.*, 1878, No. 57, and Carl Stellwag von Carion, *Abhandlungen aus dem Gebiet der prakt. Augenheilkunde*, 1882, with the illustrations, pp. 138 *et seq.* For double vision caused by paralysis of the muscles of the eye in diabetes mellitus, Leber in *Arch. f. Ophth.*, xxi. 3, 1875; the same in sausage-poisoning, in *Arch. f. Ophth.*, 1880, vol. 2; on discontinuance of the morphia habit, Levinstein in *Berl. klin. Wochenschr.*, xiii. 14, 1876; in tabes dorsalis, Bernhardt in *Virch. Arch.*, lxxxiv., 1881; Th. v. Schroeder, *Arch. f. Augenheilk.*, xxxi., 1885, in lead-poisoning; and so on. Karl Hirschberger ("Binoculares Gesichtsfeld Schielender," *Münch. Medic. Wochenschrift.*, 1890, No. 10), who has carefully investigated the subject, has given a short account of the condition in which the double images of squinting arise and drop out of the visual field.

[1] K. Lissauer, *Ueber Diplopia monocularis hysterica*, Diss. Berlin, 1893. Besides the references he gives, compare Cohen in *Casp. Wochenschr.*, 1836, No. 10; Behr in *Blasius klin. Zeitschr.*, 1837, Heft 4; Pupke in *Med. Zeitschr. v. Ver. f. H. in Pr.*, 1838, No. 4; N. Friedreich, *Beiträge zur Lehre von den Geschwülsten innerhalb der Schädelhöhle*, ii. (Würzburg, 1853); Engel, *Beitr. zur Physiologie des Auges*, 1850; Galezowski in *Ann. d'Ocul.*, liv. p. 199, 1865; Unterharnscheid in *Klin. Monatsbl. f. Augheilk*, xx., Febr. 1882; L. Bouveret and E. Chapotot in the *Revue d. médecine*, 1892, p. 728.

passing train, the pigmy size of the people we look down on from the top of a high tower, and so on.[1] Another class of visual errors is associated with the perception of certain mathematical figures and outlines. The simplest illustration of these "optical paradoxes" is the following: take two straight lines of equal length; from each end of one draw a short line at an acute angle, and from each end of the other a similar line at an obtuse angle; the second straight line will then appear longer than the first.[2]

Sensory Delusions resulting from Ambiguity of the Stimuli.—Other fallacies of perception are caused by confused or ambiguous stimuli. This ambiguity may be due to the nature of the external stimulus, as, for instance, when confused noises are heard, or objects seen at a distance, or in darkness or fog, so that the distinctive features cannot be clearly recognised. The celebrated picture of Christ on St. Veronica's handkerchief shows from a distance an apparently dead face with closed eyes, but on a nearer view the eyes appear open and the expression life-like. In another well-known picture, two girls are seen playing at a window, but, on being placed a little way off, the scene changes to a grinning death's-head.

Secondly, the ambiguity of the stimulus may depend on the percipient himself, either because the image seen does not fall on the point of clearest vision, or because

[1] For a large collection of such cases see Sully, *Illusions* (1881); also the various text-books of psychology.

[2] See G. Heymans' "Quantitative Untersuchungen über das optische Paradoxon," *Zeitschr. f. Psychol. und Physiol. der Sinnesorgane*, ix. pp. 221 *et seq.*, where references to the literature of the subject will be found, and compare also Lipps' *Æsthetische Betrachtung u. optische Täuschung; Untersuchungen zur Psychologie u. Æsthetik räumliches Formen*, which treats of these phenomena.

the sense affected has only a feeble power of discrimination. Thus two similar perfumes may be confused when the percipient is not skilled in making subtle olfactory distinctions. If such a sense encounters a new or almost new stimulus, which, as we shall presently see, must, just because of its novelty, be far more intensely felt, the chances of deception are proportionately increased. This explains why common organic sensation, which is generally only vaguely localised, so easily becomes the starting-point of delusions when subjected to unwonted conditions. Changes of sensation in the muscles and skin become subjectively changes of the substance and dimensions of the whole physical organism. Anæsthesia can induce in the patient the hallucination that he is made of wood or of glass; and paræsthesia induce sensations of shrinking, or of swelling till the room is too small to hold him and he is being crushed between its walls. I have also encountered this last sensation as a recurring dream in the sane.

Sensory Delusions caused by Defects and Pathological States of our Organism.—The imperfection of our organism opens another door to sensory delusions. We feel only one prick when both points of a pair of compasses are touching us at a certain distance apart. Again, if the fore and middle fingers of the same hand be crossed and a pea rolled between them, the effect produced is as if there were two peas. Very feeble stimuli do not reach our consciousness at all, and our perceptions are thus falsified. This is specially noticeable in a state of fatigue, when the exhausted nerve elements require exceptionally energetic stimuli to rouse them into renewed activity. The working of the motor centres is also affected by

this cause. For example, when the normal accommodation fails to take place in the eye, the images not falling on the point of clearest vision become dim and confused; or, again, though the normal adjustments occur, it may happen that the corresponding muscular sensation fails in intensity and we locate all objects in a false direction. The same result may be artificially induced by paralysing the accommodation muscles of the eye by the aid of a small dose of atropine; but indeed it may frequently be observed as a result of exhaustion or inebriation, as when a drunken man passes his hand to the right or left of his glass in misdirected efforts to seize it, or fumbles vainly for the key-hole with his latch-key. Again, slight movements of the eye may produce so little effect on the mental processes that we refer the shifting of the image on the retina, not to movement of the eye, but to an imaginary movement of our surroundings—hence giddiness after waltzing, in extreme fatigue, after smoking unusually strong tobacco, and so on.[1]

To this category belong also the sensory delusions resulting from the after-effects of a stimulus on the organism, from the reverberation of the impression, and from the difficulty of distinguishing between two successive stimuli. The impression of the coin firmly pressed into our hand by a skilful conjurer and then abstracted by him, lasts long enough for us to shut our hands with the conviction that we feel the piece of money still there. The colours on the colour-top become blended; and in the zoetrope we think we see an acrobat jumping over successive horizontal bars, whilst in reality a series of pictures

[1] J. Hoppe, *Die Scheinbewegungen* (1879).

of acrobats in different attitudes spins past our eyes. Complementary images, resulting from stimuli acting either simultaneously or successively, come under the same head, but an inquiry into these would lead us too far.

Many of the examples already cited depend on a pathological disturbance of the organism, and are regularly associated with it. Another noteworthy phenomenon of this kind, according to Himly, is the setting back of the stimuli in the scale of the spectrum in hyperæsthesia of the retina; thus, for instance, violet becomes red. The opposite occurs when the organ is in a condition of low excitability. In certain disturbances of the ear the pitch of a note is heard higher or lower than it is in reality.[1] In santonin-poisoning xanthopsia (yellow vision) occurs,[2] as also in icterus and in typhoid without jaundice.

[1] Oscar Wolf, "Unterbindung der Art. car. commun. wegen Schussverletzung" in the *Arch. f. Aug.- u. Ohrenheilk.*, ii. 2, p. 52. Wolf, who had already pointed out that when the tension of the membrane is increased a tone becomes higher in penetrating it, communicates two cases in which rarefied air, the result of obstruction of the tube in the drum-cavity, caused extreme inwards tension of the tympanum and so raised the pitch of several tones to the diseased ear. Thus in one case the middle *c* and *a* were heard a fifth, and in another case the key of A was heard a third higher than they sounded to the normal ear. After equalising the difference of pressure by inflation the sound was again heard purely and correctly. Knapp, in the *Arch. f. Aug.- u. Ohrenheilk.*, i. p. 93, explains diplacusis binocularis otherwise. Compare Burnett's case in the same *Arch.* vi. p. 241; further, Blau in the *Arch. f. Ohrheilk.*, xv. p. 233, who postulates a greater tension of the membrana basilaris for deeper hearing of a tone. See also Wittich, *Königsberg. med. Jahrb.*, iii. 40; Mach, *Sitzungsber. d. Wien. Akad.*, 1864.

[2] Lewin, *Lehrb. d. Toxicol.* (1883), p. 239. "After santonin-poisoning, besides scintillations, xanthopsia (yellow vision) was observed persisting for more than twelve hours. White or very light spots appear yellowish green, dark spots and especially the shadows of surrounding objects take a more or less deep shade of violet. In

Further, the delusions, commonly described as hallucinations, which are produced by so-called "eccentric projection" of sensation, may be reckoned as belonging to this class. Thus we often locate a tactual sensation outside our body and even refer it to the extremity of the object which we touch. In writing, for instance, we feel the paper with the pen, in fencing we feel the opponent's foil with our own. For it is the peculiarity of the tactile sense that we usually locate the sensation in the peripheral expansion of the nerves. Accordingly, if the nerve is stimulated in another

coloured stuffs red seems purplish, yellow very pale and greenish, violet darker, orange pale red, crimson dark, and green yellow-gray" (Mari). This xanthopsia, noted by Hufeland as occurring in icterus and also in typhoid without jaundice, is by some authors supposed to be dioptric in character. Since both in santonin-poisoning and in fatal cases of icterus (compare Moxon in the *Lancet*, i. 4, January 1873) the refracting media of the eye prove colourless, and further, since in old age, when the sight is good, yellow lenses are found (van Swieten), de Martini (Naples) in *Comptes rend.*, lxvii. p. 259, has assumed a molecular effect on the retina, and a change in its tension through which the vibratory reaction of the nerve particles is altered under light stimulus. E. Rose, in *Virch. Arch.* xvi. (1859) pp. 233 *et seq.*, xviii. (1860), 1, 2; and others suppose rather a narcosis or partial blindness associated with shortening of the colour spectrum. Compare further L. v. Mauthner, "Ueber Santonin" in *Oestr. Zeitschr. f. Kinderheilk.*, 1856, Febr.-March; the experiments of Dr. Alois Martin in *Büchn. n. Rep.*, ii. 5; Prof. Falk in *Deutsch. Klin.* (1860), 27, 28; Giov. Franceschi in *Journ. d. Chim. méd.* 5, Ser IV. p. 373 (1868); R. Farquharson in *Brit. Med. Journ.*, 21st Oct. 1871; Th. Krauss, *Ueber die Wirkung des Santonin und des Sant.-Natron*, Diss. Tübingen (1869); J. Heimbeck in *Norsk. Mag. f. Lägevinds*, 3 R. xiv. 1 (1884). Compare on other chromatopsies, for example on blue vision, Hilbert, "Zur Kenntniss der Kyanopsie," *Arch. f. Augenheilk.*, xxiv. 3 (1890), p. 240. The case of xanthopsia after a gunshot wound in the nasal region, quoted by Hilbert, *Arch. f. Augenheilk.*, xv. p. 419 (1885), also points to the central origin of such colour hallucinations. Compare on the subject of red vision, *Wiener med. Presse*, xxiii. 42; *Centralbl. f. pract. Augenheilk.*, February 1884, November 1881, June 1883, February-March 1885.

place, we refer the sensation to the accustomed spot in the periphery just the same. When the elbow is sharply struck, causing thereby stimulation of the ulnar nerve, the pain is felt in two places, in the elbow, because of the stimulation of the sensitive filaments spread out there, and also in the peripheral network of the ulnar nerve in the hand. So after amputation all stimuli applied to the nerve stumps are felt in the lost limb, which still seems to be there, so much so that the patient imagines he can move it about, even years after he has lost it.

Professor William James sent a circular containing questions on this point to 800 persons who had suffered amputation, and received 185 answers. He reports[1] that three-fourths of these persons stated that they experienced sensations in the lost limbs, while in a still greater percentage of cases sensation had been experienced, but had gradually faded out after the operation—in a few hours, weeks, months, or years, as the case might be. Sensation in the lost limb, sometimes felt as burning or twitching, cramp in the heel or toes, or numbness—and sometimes consisting in a mere impression that the missing member is *there*—is so vivid in the first few weeks after the operation that one patient, for instance, found himself getting out a pair of scissors to cut the toe-nails, so distinctly did he feel them; and others tell how they have involuntarily reached down their hands to scratch the missing foot. Sometimes this illusion persists much longer without diminishing in distinctness, as in the case of the man who felt as if he had, with the artificial limb, three legs in all, and who found the missing member very much in the way in coming downstairs. Out of superstition, imagining that the pain he felt in the amputated

[1] For a detailed account see William James, "The Consciousness of Lost Limbs," in *Proceedings of the American S.P.R.*, i. p. 249; compare *Principles of Psychology*, by the same, ii. pp. 38 *et seq.*; Weir Mitchell, *Injuries to Nerves;* Valentin, *Lehrbuch d. Physiol.;* A. Cramer, *Die Hallucinationen im Muskelsinne bei Geisteskranken*, etc., pp. 85 *et seq.;* Paré, *Oeuvres compl.*, ii. pp. 221, 231; Guéniot in *Journ. d. Physiol.* (xv.) iv. p. 416; Rizet in *Gaz. de Paris*, 1861, No. 44.

parts depended on some maltreatment or uncomfortable resting-place of his buried leg, one of Professor James's correspondents wrote that he had already disinterred and changed its position eight times, and he asked the Professor to advise him whether to dig it up again, saying he "dreaded to." The case of longest duration reported is that of a man who had had a thigh amputation performed at the age of thirteen years, and who, after he was seventy, still felt the lost foot distinctly. The imaginary position of the amputated part varies: either it maintains an independent position of its own, or it follows the movements of the sound limb, or it may even appear fixed in the attitude it occupied immediately before the operation. A shoulder-joint case said his arm seemed to lie on his breast with closed fingers, just as it did eight or ten hours before amputation.

As an explanation of this phenomenon, described by Du Prel as a "feeling of spiritual unity" (Integritätsgefuhl), and by him adduced as a proof of the existence of an astral body,[1] Professor James goes on to assume that just as certain brain-centres respond to any and every stimulus by sensations of light and of sound, so do certain other centres respond by the sensation of a foot, with its toes, heel, etc. In the normal state the foot thus felt is located where the eye can see and the hand touch it. This immediate inner sensation still persists, even when the foot is cut off, and would naturally, one may suppose, be located about where it used to be, in the absence of any counter-motive. There would be such a counter-motive if nerves normally excited by foot-sensations were to find themselves excited every time the stump was touched; and foot-sensations and stump-sensations being thus associated, would end by merging in each other. This merging does take place in many cases of what Guériot calls "subjective heterotopy," that is to say, that the extremity, immediately after the operation, seems to be in its old place, but by degrees approaches the stump. This feeling of gradual shrinkage generally depends on the feeling of the contact of the extremity with the stump. The hand may seem to spring directly from the shoulder, or the foot from the knee. A sensation may also be experienced as though the extremity were diminishing in

[1] Du Prel, *Die Monistische Seelenlehre*, pp. 157-166; English translation, *The Philosophy of Mysticism*, 1889.

size, the foot becoming like a child's foot, for instance. Thus in many cases the consciousness of amputated limbs is gradually lost through merging. Of course where degeneration and atrophy of the nerve-paths ascending to the cortical centres has been proved, we have an all-sufficient reason why the lost member can no longer be felt.[1] There are other cases, however, where assimilation is hindered by the nerve-stumps being deeply buried in the tissues. When this is the case, foot-feelings and stump-feelings remain distinct, and the former will occur on every stimulus applied to the nerve-stumps. A patient of Weir Mitchell's had long lost the sensation of his amputated hand, but when faradisation was applied to the shoulder, this feeling was so suddenly and vividly restored that he cried out, "Oh, the hand!—the hand!" and attempted to seize the missing member.

It would seem that even in cases of congenital defect of the extremities, the same phenomena—*i.e.*, the feeling as of movement in the missing finger, or as though the congenitally shrunken arm were of the usual length—have been observed.

The Psychological Conception of Fallacious Perception.—On returning to the consideration of individual fallacies of perception we are met at once by the question whether these things are really seen, heard, in a word, perceived, or whether the hallucinated person only believes that he hears, sees, etc. The latter explanation is the most obvious, and many writers have accordingly been led to consider sensory delusions as something quite different from sensory perceptions, and have described them as images or memories of exceptional vividness. Thus Crichton[2] (1798) defines

[1] François Franck, *Leçons sur les maladies de Cerveau* (1877), p. 291. Compare also the note by Gudden on atrophy of the optic nerve in enucleation of the eyeball extending into the occipital-lobes of the brain, and histologically distinguished from descending degeneration, "Ueber die Kreuzung, etc.," *Ges. Abhandl.*, p. 140; Monakow in *Arch. f. Psych.*, xiv., xvi., and xx.; Stauffer, *Ueber einen Fall von Hemianopsie* (Marb. Diss. 1890).

[2] Crichton, *An Inquiry into the Nature of Mental Derangement*, ii. p. 342.

hallucinations and illusions as errors of the mind by which in the one case ideas are taken for matters of fact, and in the other case real objects are falsely represented, but without any general disturbance of the intellectual faculties. Hibbert[1] (1825) holds that they are ideas and memories which surpass in vividness the actual impressions of the moment. Calmeil calls them ideas transformed into material impressions and referred to the activity of the peripheral organs, although these latter remain passive. Aubanel[2] (1839) regards hallucinations as a form or variety of mental alienation, in which delirious ideas are transformed into sensations, or real sensations perverted by assimilation to those delirious ideas. Michéa[3] (1846) considers hallucinations as the transformation—generally involuntary—of memory and imagination into the semblance of sense-perception, and Dendy[4] (1841) calls hallucination a past and illusion a present recollection. Moreau[5] follows (1845) with the hypothesis that there are really no hallucinations but only a hallucinated state which, from a psychological standpoint, is identical with the dream state. In this state the mind is supposed to transfer the products or creations of its fantasy to real life, and to persuade itself that it has heard, seen, or felt as in the normal condition, when it has really only imagined it heard, saw, or felt. Esquirol[6]

[1] S. Hibbert, *Sketches of the Philosophy of Apparitions*, p. 1.

[2] Aubanel, *Essai sur les hallucinations.*

[3] Michéa, *Du délire des sensations*, p. 82.

[4] Dendy, *The Philosophy of Mystery.*

[5] Moreau (de Tours), *Du hachisch et de l'aliénation mentale.*

[6] Compare various articles by Esquirol reprinted from the *Dictionnaire des sciences médicales.* Further, *Des maladies mentales* (English translation, 1845), and in the *Arch. génér.* (1832), "Sur les illusions des sens chez les aliénés."

speaks of hallucinations as cerebral or psychical phenomena which occur independently of the senses, and consist of external impressions which the patient thinks he experiences, though no outward material cause acts upon his senses. Elsewhere he propounds the often controverted explanation that the illusory impressions of the hallucinated subject are mental images or ideas, reproduced by the memory, elaborated by the imagination, and personified through habit. Szafkowski[1] (1849) agrees practically with Esquirol, and so does Falret[2] (1850), with some slight modifications. With these authors may be reckoned Lélut[3] and Leuret,[4] since they hold sensory delusion to be a hybrid phenomenon intermediate between ideation and sensory perception; and also A. Bottex,[5] Brierre de Boismont,[6] and others.

In face of all these opinions we must not forget, however, that all sense-perception is ultimately a psychical phenomenon, and that, to use Gurney's words,[7] "*Every psychological phenomenon that takes the character of a sense-impression is a sense-impression.* When the hallucinated person says, I hear so-and-so, or, I see so-and-so, the words are literally true; for to him a hallucination is not merely like, or related to, a sense-impression, it is identical with it." Of course, a man who has been staring at the sun will as a rule

[1] P. Rufin Szafkowski, *Recherches sur les hallucinations au point de vue de la psychologie, de l'histoire et de la méd. légale*, p. 8.

[2] Falret, "Leçons cliniques des maladies mentales," *Gazette des hôpitaux* (1850).

[3] Lélut, "De la folie sensoriale," in *Gaz. méd.* (1833).

[4] Leuret, *Fragments psychol. sur la folie*, p. 33.

[5] A. Bottex, *Essai sur les hallucinations* (1836).

[6] Brierre de Boismont, *Des hallucinations* (2nd ed., 1852; translated by R. T. Hulme, 1859).

[7] Gurney, *loc. cit.*, p. 155.

think it less accurate to say that he *sees* a shining disc wherever he looks, than to say that he *fancies* it. In the same way, we follow the beaten track of thought when we say of a dream or some such sensory delusion, "I thought I saw," "I imagined I heard," and so on.[1] Others, again, repudiate these modes of expression, and maintain that the seer of visions or the dreamer of dreams not only believes he sees, but sees and hears in very fact.[2] Thus both parties commit the same error, in that they take the belief in sense-perception for something different from sense-perception itself. As a matter of fact, to "believe one sees" and "to see" are two expressions meaning the same thing. The former merely reiterates the fact that seeing, etc., is a purely subjective act. A hallucination is then a sense-perception like any other, "only there happens to be no object there, that is the whole difference."[3]

Accordingly we find it taken for granted in nearly all modern psychological inquiries, that hallucination is a sense-perception, and that the only question of practical importance—viz., whether the object is or is not really there—is psychologically irrelevant. Griesinger's paraphrase[4] of hallucinations as "subjective sense-images which are projected outwards and take apparent objectivity and reality," and

[1] The usual expression employed by the Greeks was δοκεῖν, by the Romans *videri*, in speaking of dreams and visions. In middle-high-German *dunken* is generally used. (P. Radestock, *Schlaf und Traum*, Note 222.)

[2] For instance, Griesinger, *Die Pathol. u. Therapie d. psych. Krankheiten* (2 Ed. 1867), p. 86; English translation, *Mental Pathology and Therapeutics* (London, 1867): "The patient sees, hears, smells really, he does not merely imagine that he sees and hears."

[3] W. James, *The Principles of Psychology*, ii. p. 115.

[4] Griesinger, *loc. cit.*, p. 85.

Esquirol's contention that we must regard as hallucinated the person "qui ait la conviction intime d'une sensation actuellement perçue lorsque nul objet extérieur propre á exciter cette sensation n'est à portée des sens,"[1] are now combined in the short definition, "Hallucination is perception without an object."[2] Indeed Taine availed himself of this conception to invert the proposition; for since, he says, what we objectify in normal perceptions is present sensation, while in hallucination what we objectify is remembered or represented sensation,[3] "au lieu de dire que l'hallucination est une perception extérieure fausse, il faut dire que la perception extérieure est une *hallucination vraie.*"[4]

From the standpoint now arrived at it seems unjustifiable in a discussion on fallacies of perception to place the hallucinations and illusions of insanity in opposition to those of other states; or, like Hagen, Schüle, and Kandinsky, to exclude dreams and reckon as hallucinations only those fallacies of perception which appear among true sensory impressions received from the external world and with a vividness equalling theirs.[5] Whether I "hallucinate" with eyes closed or open, whether I see distinct and vivid images, or dim floating shapes, is a matter of no

[1] Esquirol, *Des maladies mentales* (1838).

[2] Ball, *Leçon sur les maladies mentales* (1881), p. 62.

[3] H. Taine, *De l'intelligence*, 4th edition, ii. p. 13.

[4] The merit of having first assigned to hallucinations this sensory character, in opposition to the view of the authors just quoted above, who regard them merely as vivid ideas with the appearance of sense-perceptions, belongs in Germany to J. Müller and Burdach, and in France to Baillarger ("Des Hallucinations, etc.," in the *Mém. de l'Acad. roy. d. Méd.*, xii.).

[5] Hagen, "Die Sinnestäuschungen in Bez. auf Physiol., Heilk. u. Rechtspflege" (1837).

importance. The dimmest, most formless mist which I "see," or "think I see," is really seen, and even though this visual impression may have arisen subjectively, it should nevertheless be called a fallacious perception, hallucination, or illusion, quite irrespectively of how it originated, or what circumstances favoured the appearance of the phenomenon,[1] and quite irrespectively also of its influence upon the percipient, or his attitude with regard to it. Thus all hallucinations and illusions may be reckoned as fallacious perceptions, whether observed in the sane or the insane, whether occurring in sleep or in the waking state, whether arising spontaneously or experimentally induced.[2] *Of course we must not on that account assume that the physiological process accompanying hallucinatory perception depends in all these cases on similar conditions of the brain, although it is highly probable that it rests on analogous functional principles.* Before we pass on to this question we must first consider the various conditions under which fallacious perceptions occur, and thus familiarise ourselves with one group of the facts concerned.

[1] Michéa, who seeks to separate the false hallucinations—those of dreams, for instance—from the true ones of the waking state (*op. cit.*, p. 102), and says that the existence of hallucinations implies the waking state, as dreams imply that of sleep, has yet to add that the state between waking and sleeping is peculiarly favourable to hallucinations.

[2] Among those who hold as analogous phenomena dreams, the delirious images of fever, hallucinations, etc., are: Maury, Morel *op. cit.*, A. Krauss, "Der Sinn im Wahnsinn," *Allg. Zeitschr. f. Psych.* xv. 6, xvi. 1, 2; A. Mayer (Mayence), *Die Sinnestäuschungen* (Vienna, 1869); compare also Hoppe, *Erklärung der Sinnestäuschungen*, etc., and Kohlschütter in the *Zeitschr. f. ration. Medic.*, R. iii., B. 34, p. 46.

CHAPTER II.

FALLACIOUS PERCEPTION IN VARIOUS PATHOLOGICAL AND PHYSIOLOGICAL STATES.

Esquirol's distinction between Hallucination and Illusion—Fallacies of Perception in the Insane: In Amentia, Dementia, Melancholia, Mania, "Folie Circulaire," Delusional Insanity and Paranoia, General Paralysis—The share of the several Senses in these Delusions, and their effect on the Patient—In Psychoneuroses: Epilepsy, Hysteria—In Ecstasy—In States of Intoxication: Alcohol, Chloroform, Ether, Haschisch, Santonin, Cinchona, Opium, Nitrous Oxide Gas—Specific Action of Narcotics and Personal Reaction—In acute Somatic Diseases—In Dreams—In Hypnosis—Crystal Visions—Dissociation of Consciousness the Common Characteristic of all these States.

IN accordance with Esquirol's definition,[1] two sorts of sensory deception are generally distinguished:—(1) Illusions, or "the false interpretation of external objects;" (2) Hallucinations, or "subjective sensory images" which arise without the aid of external stimuli, but are projected outwards and thus assume apparent objective reality.[2]

[1] Esquirol, "Sur les illusions des sens chez les aliénés," *Arch. gén.*, 1832.

[2] Griesinger, *loc. cit.*, § 52; still earlier Arnold, *Observations on the Nature, Kinds, Causes, and Prevention of Insanity* (1782), speaks of the mental state of the individual who thinks he sees and hears what others neither see nor hear, and who imagines he holds converse with beings or perceives objects which are not of the senses, or which do not so exist in the outward world as they appear to him. Writers before

As briefly indicated above, mere misinterpretations of sense-perceptions should not be regarded as sensory fallacies. In the long run, therefore, no satisfactory theory can be based on Esquirol's distinction, as is sufficiently indicated by the many unsuccessful attempts to reach one. But, generally speaking, nearly all observers are agreed to consider illusion as a mixture of subjective and objective elements of perception, or as an incomplete sensory delusion, and to restrict the word hallucination entirely to new sensory creations. If a man sees something where there really is something to be seen, then he is said to be the subject of an illusion; if he perceives something where there is nothing, then he is said to be hallucinated. Apart from other objections, such a definition is open to the reproach of employing a physical differentia in a matter purely psychical;[1] but as usage has to a certain extent fixed

Esquirol do not agree in their terminology. Sauvages and Felix Plater describe as hallucinations those errors which are caused by failure in the functions of the outer sense organs, and include with them singing in the ears, diplopia, vertigo, hypochondriasis, and somnambulism. Under the name of "deliria," the phenomena which have their rise in the brain are somewhat vaguely distinguished. Darwin agrees with these writers in his *Zoonomy*. Ferrier, *An Essay towards a Theory of Apparitions*, p. 95, comprehends under hallucination all deceptive impressions from *muscæ volitantes* to the most terrifying phantoms. Even in the middle of the present century the question of distinguishing between illusions, hallucinations, and delusions played an important part in a murder trial in England; see Bound in the *Asylum Journal*, July 1856.

[1] Moll (*Hypnotism*, fourth English edition, p. 112) allows himself to be led into a similar error when he says illusion may be regarded as the sum of a positive and a negative hallucination, as in each illusion something present is not perceived, and something not present is perceived. What difference would there be then between an illusion and a fully developed hallucination which blots out that part of the field of vision which it occupies?

the meaning of the two words, we shall adopt, at least for the present, the usual distinction, employing *illusion* to denote a sensory deception which may be referred to some external nerve stimulus, and *hallucination* to denote one which cannot so be referred.

One other distinction must be briefly considered, the division, namely, of hallucinations into "positive" and "negative." While by the former is meant the subjective perception of an object where there is none, by the latter is understood the hallucinatory non-perception of an object which is present. As there is considerable confusion about the exact nature of "negative hallucinations," I shall refer to the question in more detail later, and content myself here with this brief reference.

Fallacious Perception in Insanity.—The most frequently quoted of all sense-deceptions are those of insanity. Some authors have sought to divide them according to their origin into "idiopathic," those which are primary but which may also occur in secondary consensual morbid states, and "symptomatic," those which occur only as a secondary symptom of insanity.[1] In any case a distinction ought to be drawn between sporadic hallucinations not associated with particular emotional states and hallucinations which reflect the ruling mental tone. This distinction has prognostic importance, since

[1] Kieser, *Elemente der Psychiatrie*, p. 298; Michéa, *op. cit.* Moreau, *Mémoire sur le traitement des hallucinations par le datura stramonium*, divides hallucinations as follows:—1, those which are isolated and occur without any widespread mental disturbance, and of the subjective origin of which the patient is aware; 2, those which, though indeed primary phenomena, are associated with more or less profound psychical disturbance; 3, those which are not the causes but the results of mental alienation.

observation seems to prove that hallucinations depending on certain morbid emotional states are capable of disappearing with them, whilst independent hallucinations seldom admit of cure, and pass over into the state of secondary psychical weakness.[1]

The particular forms of insanity in which hallucinations most frequently occur are such as are associated with dreamlike beclouding of the intellect. Thus they are a frequent phenomenon of amentia, but are seldom seen in acute dementia with its deep-reaching paralysis of the higher psychical functions.[2] Opinion as to the frequency of sensory hallucinations in melancholia has altered very much of late years, chiefly because of the altered meaning of the term, and because cases previously classed under melancholia are now referred to other groups.[3] Thus, while hallucinations were at one time regarded as frequent phenomena of this state,

[1] Griesinger, *op. cit.*, p. 98. On the other hand, we shall see that such "independent" hallucinations, since they are frequently conditioned by local affections of the sensory apparatus, may disappear on local treatment.

[2] E. Mendel, "Der gegenw. Stand der Lehre von den Hallucinationen," *Berl. klin. Wochenschr.*, 26, 27 (1890).

[3] Griesinger, Hagen. V. Krafft-Ebing, *Die Sinnesdelirien*, ii., 1864, considers the state of melancholia specially favourable to sensory delusions, because it is characterised by extreme monotony of thought, and by vivid mental images which fill the consciousness. The hallucinations of this state are described as numerous and varied; there are those associated with hypochondriacal delusions of sin and of persecution, for instance, and the peculiarly vivid and terrifying apparitions of melancholia attonita. Compare Baillarger, "De l'état désigné chez les aliénées sous le nom de stupidité," *Ann. Méd. Psych.* (1843); Griesinger, *op. cit.*, p. 252. Weiss, *Compend. der Psych.*, p. 221, denies their occurrence. Séglas and Londe, in *Arch. de Neurol.* (1892), 68, 69, hold that auditory hallucinations of voices seldom occur in melancholia, and that they are only found associated with hysteria.

they are now held to be rare, or altogether absent from it. In mania hallucinations[1] only appear when there is clouding of consciousness, and are generally vague and indistinct.[2] On the other hand, illusions are frequent, and mistakes of identity are specially characteristic of this state, though not absent from other forms of insanity. Snell,[3] who devotes an article to them, is of opinion that the confusions are not so much caused by mere resemblance, but that a general psychological law lies at their root; that the patient is powerless to escape from the familiar thought-channels, and therefore grafts his new impressions on to his old opinions and ideas. In *folie circulaire* hallucinations occur in the maniacal period in association with profound mental disturbance, but

Kraepelin, *Psychiatrie*, 4th ed., says in his definition of melancholia, that from the depression characteristic of the state, no distinct, developed sensory delusions spring up; and he attributes to the occurrence of hallucinations associated with fixed delusions of persecution, a diagnostic value, distinguishing the fear-stupefaction form of hallucinated insanity from melancholia.

[1] Krafft-Ebing, *op. cit.*, maintains, on the other hand, that in mania many deceptions of sight and hearing occur which exert a powerful though transitory effect on the sufferer, driving him to violent outbreaks, and tending generally to bring on acute attacks. But in the tumultuous rush of ideas, none of which can remain fixed, hallucinations are generally of minor importance; besides which the sufferer cannot give them more than a passing attention, they disappear in the whirl of the psychical processes, and do not usually remain to burden the mind with a fixed idea.

[2] Kraepelin, *op. cit.*, p. 276. A death's-head appears on the wall; the devil had been looking in at the window.

[3] Snell, "Die Personenverwechselung als Sympt. d. Geistesstörung," *Alg. Zeitschr. Psych.*, xvii. pp. 545 *et seq.*; compare Kraepelin, "Ueber Erinnerungtäuschungen," *Arch. f. Psych.*, xviii. pp. 230-239; Alt, "Das Symptom der Personenverwechselung bei Geisteskrankheiten," *Allgem. Zeitschr.*, xliv.

as regards their occurrence in the melancholic phase opinion is again divided.[1]

Delusional Insanity and Paranoia, on the other hand, abound in hallucinations, so much so that some forms classed under this head are designated "hallucinated insanity" (*hallucinatorischer Wahnsinn*) and "paranoia hallucinatoria." The sense-deceptions of delusional insanity are vivid in their externalisation and resemble in their content the fixed ideas which they embody. In cases which end in mental decay the hallucinations frequently persist long. In depressive monomania they are more fragmentary and vague, but are often kept alive by distressing dreams.

Paranoia Hallucinatoria generally begins with an auditory hallucination. The sufferer hears taunting or insulting voices calling after him in the street, and making injurious insinuations about him, or sometimes unseen speakers incidentally let fall words which confirm his forebodings. In the later stages of the disease also auditory hallucinations predominate,[2] and may be extremely vivid and distinct,

[1] Hagen, *Allg. Ztschr. f. Psych.*, xxv. pp. 89-92. "No psychosis persisting for any length of time, in which melancholia and mania frequently or constantly alternate, is associated with hallucinations." Other writers agree with him, for instance Sander, "Sinnestäuschung" in the *Real-Encyklopädie*, Bd. xviii.; while Mendel opposes this view. Weiss concedes the occurrence of hallucinations in the melancholic phase of circular insanity. Baillarger, J. P. Falret, and Kirn have observed none, while J. Falret concedes them in a few severe cases. Kraepelin, *Psych.*, encountered them in cases of profound mental disturbance. Meynert holds that in melancholia the exhausted hemispheres admit of them more easily than in acute mania.

[2] Marandon de Montyel (in the *Ann. Méd. Psych.*, 7 ser. xi. 2) endeavours to refute Christian's assertion that cases of paranoia have been met with where the insane ideas, arising out of sexual paræsthesia, do not take the form of "delusions of pride," by maintaining that these were not true cases of paranoia, since no auditory hallucinations were present.

although they also occur as soundless inner voices. A kind of auditory hallucination worthy of special note is "audible thinking," wherein the patient hears his own thoughts spoken aloud, and imagines that they can be heard by everybody, or else hears them repeated or dictated to him by an imaginary being.[1] Fallacious perceptions of the other senses are also not uncommon. Many sufferers see the persecutors who torment them from a distance by means of magnetic and electrical apparatus.[2] They entertain kings and princesses, and receive angels' visits; all these hallucinations occur in a state of full consciousness. In some cases they are highly varied, and in others they are characterised by extreme monotony, and are closely bound up with the dominant fixed idea which they illustrate. They are frequently stationary, but may gradually change with a change of the delusion;[3] also in cases where the hallucinations do not really belong to the dominant ideas of paranoia, they may still occur when the disease is associated with periodic acute attacks.

The most varied and opposite views obtain on the occurrence of hallucinations in general paralysis,[4] prob-

[1] Comp. Grashey's description, "Ueber Hallucinationen," *Münch. med. Wochenschr.*, 1893.

[2] Haslam, *Illustrations of Madness* (1810).

[3] Kölle, "Ueber Variabilität d. Wahnvorst. und Sinnestäuschungen," *Alig. Ztschr. f. Psych.*, ii. pp. 186 *et seq.*

[4] They are absolutely denied by the elder Falret (*Des maladies ment. et des asiles d'aliénés*, 1864) and Huppert (*Arch. für Psych.*, iii. p. 330); Colovisch (*Études sur l. paral. gén.*) questions the occurrence of hallucinations in general paralysis among women; v. Krafft-Ebing (*Lehrb. d. Psych.*, p. 665): "In general paralysis hallucinations are very rare phenomena, so rare indeed that on their occurrence one is forced to suspect a false diagnosis, and to refer them rather to alcoholic paralysis." Even so early as 1859 Thomeuf noted

ably because of the ambiguity of the line drawn between hallucinations on the one hand, and delusive ideas, illusions and paræsthesiæ[1] on the other; and also because of the difficulty of proving that hallucinations are really present in the advanced stage.[2]

[1] Generally only those of a disagreeable nature are taken into account, and are regarded as causes of the hypochondriacal delusions of the patient. Klein has on the other hand, in the *Ann. méd. psych.*, vii. (1888), p. 437, sought to refer the euphoristic states of paralytics to paræsthesia of an agreeable nature.

[2] Baruk, *op. cit.*

(*Gaz. d. hôp.*, 1859) the infrequency of hallucinations in paralysis as opposed to "Lypemania alcoholica" with paralytic crises. See also Fournier (*Dictionnaire de médecine et de chirurgie prat.*, i. p. 657). Hagen is of opinion that hallucinations occur but seldom in paralysis and chiefly in the phase of depression; while Dagonet (*Traité des malad. ment.*, 1894), though he indeed notes their infrequency, observed them chiefly in the "maniacal excitement." Régis (*Manuel d. méd. mentale*, 1885), Ball (*Leçons sur les maladies mentales*), Jules Falret (*Études cliniques sur les maladies mentales et nerveuses*), Sander, *loc. cit.*, also Simon and others, describe their appearance as rare. Hitzig, in Ziemssen's *Cyclopædia of Medicine*, takes this view with regard to visual and auditory hallucinations, but describes illusions of the organic sense as frequently occurring. These latter are, on the other hand, classed by Westphal in his work on General Paralysis, with mental delusions (Wahnideen). Linstow also observed frequent organic hallucinations in general paralysis. Besides the older writers who have maintained the frequency of hallucinations in general paralysis, Morel may be named (*Traité des maladies mentales*, 1860) as having noted that the periods of exaltation were favourable to their occurrence, Foville (see article, "Paralysie Générale," in the *Dictionnaire de méd. et d. chirurg. prat.*, 1878), Voisin (*Traité de la paral. gén. des aliénés*), Girma (*Les hallucinations dans la paral. génér.*, 1881), Claus ("Ueber das Vorkommen von Hallucin. bei der dem. paralyt.," *Allg. Zeitschr. f. Psych.*, 1878, pp. 35, 551), Schüle, Mendel (*Die progressive Paralyse der Irren.*, 1880). Mickle considers that hallucinations and illusions occur with greater frequency than was formerly supposed; so also Christian, Ritti, Baruk (from whose work, *Les hallucinations dans la paral. générale*, 1894, I have taken part of this summary). Acker also found hallucinations in over a third of his cases, and Gelhorn (*Die*

Their content depends on the stage of the disease, and is often childishly inconsistent and erratic.[1] One patient thinks himself visited by a golden-haired angel, or bidden to a splendid feast; another tries to climb the wall of his cell, because the king and the chief of police are up there waiting for him; and a third engages in furious combats with phantasmal monsters, or shrieks aloud for help because imaginary murderers attack him.[2] It is often possible to induce hallucinations in paralytic subjects by powerful suggestion.

Halluc. bei der dem. paralyt., 1890) in 32 per cent. of his. An analysis of the most important figures yields the following results :—

Communicated by	No. of Cases of Paralysis observed.	No. of Cases in which Hallucinations occurred.	Percentage.
Aubanel and Thore	120	8	6.6
Brierre de Boismont	147	37	25.1
Saury	109	59	54.1
Mickle	100	55	55.0
Obersteiner	194	20	10.3
Jung	127	69	54.3
Mendel	181	65	35.9
Acker	14	5	35.7
Diez	88	6	6.9
Gelhorn	100	32	32.0
L. Meyer	19	2	10.5
Obermeyer	12	1	8.33
TOTAL	1211	359	27.4

These cases are distributed over all stages of the disease, even including the stage of advanced dementia.

[1] Such cases as that communicated by Baruk, *op. cit.*, p. 46, in which the same hallucination shaped the delusions for *months*, are very exceptional. Baruk's patient, a paralytic, was continually prophesying that the end of the world would take place on a certain day. As the final catastrophe seemed to hang fire, however, he announced that he had heard a voice in the night saying that it was postponed till the 5th of September.

[2] Brierre de Boismont, *op. cit.*, pp. 193-195.

Generally speaking, hallucinations may be found in progressive dementia and mental weakness during the earlier stages, but they become less frequent as the disease advances, and as the patient, becoming gradually accustomed to them, no longer feels the keen interest he displayed at first, nor allows himself to be provoked by them into outbreaks of frenzy. "As the mental images become less complex and vivid, as memory fades and the patient gradually sinks into profound psychical weakness, hallucinations and illusions become ever rarer; the former, indeed, are almost unknown in advanced general paralysis, and the latter occur but seldom."[1]

Various writers furnish data concerning the occurrence of hallucinations amongst the insane in general. Esquirol states, for instance, that in about 80 per cent. of insane persons hallucinations may be observed. Michéa gives 106 out of 206, Falret about 33 per cent., Luys 128 out of 402; but these figures are too vague to be of much value. Probably their vagueness is due partly to the difficulty of making accurate comparisons, and partly to the ambiguity of the line drawn between sensory delusions and fixed ideas, paræsthesiæ, etc.

The Share of the Various Senses in the False Perceptions of the Insane, and their Significance for the Patient.—If we now consider shortly the part which the various senses play in the hallucinations of insanity, and their importance for the patient, we shall find that hallucinations of taste and smell (which are indeed difficult to distinguish from illusions,[2] and also from hyperæsthesia of those senses)

[1] Krafft-Ebing, *Die Sinnesdelirien*, p. 48.

[2] For instance, resulting from disease of the mouth or tongue, etc.

are on the whole infrequent. Where hallucinations of taste have been noted they are mostly nauseous or poisonous (arsenic, copper, filth), and frequently give rise to refusal of nourishment, or it may be to continued spitting.[1] In the early stages of paralysis, on the other hand, gustatory hallucinations of an agreeable nature are sometimes reported,[2] the patient perhaps describing the enjoyment of all the various dishes of an imaginary *menu*. Olfactory hallucinations are, on the whole, infrequent, and are seldom of an agreeable character. The experiences of the patient who declared he smelt all the perfumes of Arabia and the East are exceptional, for hallucinations of this sense are, generally speaking, associated with delusions about bodily foulness, and odours of corruption and corpses, due to visceral disturbances. Lélut reports the case of an insane woman who declared that the pestilential odours she perceived arose from corpses buried in certain vaults under the Salpêtrière. Sometimes, haunted by the fear of being murdered, the sufferer perceives everywhere the fumes of charcoal, noxious gases, and particles of poisonous dust.[3] Olfactory hallucinations seldom

[1] Michel in *Gaz. des hôp.* (1864), 112. Or rather, may not the increased salivation lead to spitting, and spitting, associated with "automatic" movements of the tongue, give rise to a delusive explanation on the patient's part?

[2] Probably these ought to be regarded rather as fables of the diseased mind (*Phantastereien*). An example of an agreeable subjective taste-impression of specially long duration is communicated by Marc, *De la folie dans ses rapports avec les questions medico-judiciaires* (1840), i. p. 191. In this case the patient licked the walls of his cell and the threshold of the door almost daily for hours together, so that numerous spots and hollows caused by this practice were visible in the plaster of the walls. He imagined he was tasting Japanese oranges.

[3] Auzouy in *Gaz. des hôp.* (1860), 43.

appear alone, but are generally associated with other sensory fallacies. Some authors consider that they belong more to the early stages of insanity.[1] They are frequently found in association with local disease of the ovaries, and of the reproductive organs in general.[2]

There is not much to note concerning hallucinations of the tactile sense. We shall consider those of the muscular sense later. Hallucinations of the cutaneous sensibility, of the organic sense, and the like, are not easily distinguished from paræsthesia, and however important they may be in building up mental delusions, they are, as a rule, too vague to influence the content of consciousness directly. It is only when a darkened intelligence "seizes upon them as

[1] Brierre de Boismont, *op. cit.*, p. 106; Griesinger, *op. cit.*, p. 102; v. Krafft-Ebing, *Sinnesdelirien*, p. 39.

[2] Cloquet, *Osphrésiologie*, p. 138; Weisse, "2 Fälle von Delirium der Nase," *Hamb. Zeitschr. f. d. ges. Med.*, v. (1837). Brierre de Boismont, *op. cit.*, p. 212: (hysterical women) "complain . . . of the fetid air they breathe, or the detestable taste they have in the mouth." Savage, *Insanity and Allied Neuroses* (Clinical Manual): "The climacteric is associated with changes in the reproductive organs, and as a consequence there are frequently hallucinations of smell. I am impressed with the fact that where we have ovarian troubles we may expect to find hallucinations of the sense of smell and taste." Krafft-Ebing, "Ueber Irresein im Klimakterium," *Allg. Zeitschr. f. Psych.*, xxxiv. 4 (1877), has found olfactory hallucinations in disturbance of the sexual functions only in association with masturbation and uterine disease, and considers them as depending on sexual excitement in general, but not on the climacteric as such. Schrenck-Notzing, *Die Suggestionstherapie bei krankhaften Erschein. des Geschlechtssinns*, p. 22, holds that all the hallucinations associated with sexual psychosis, olfactory hallucinations of course included, are of a repulsive character. Schlager, on the other hand ("Ueber Illus. im Bereich des Geruchssinnes bei Geistesgestörten," *Wiener Zeitschr.*, N.F., i. 19, 20 (1858), denies the causal nexus between these and states of sexual excitement occurring at the same time, and considers their coincidence as merely fortuitous, or rather as depending on the excitement of the nervous system generally.

a basis for a new conception of the ego and the environment," that they become of primary significance.[1] But such significance may always be attributed to a hallucination of either of the higher senses, though opinion is divided as to which of these two senses plays the greater part.[2]

Visual delusions may take the form of dreams or of visions by day or night. In mental disease occurring in childhood (10-15 years)—when hallucinations would appear to be specially frequent, even in forms of disease less often associated with them in adult life—the visual type predominates.[3] When there is no widespread intellectual disturbance, visual delusions are, generally speaking, more easily recognised as such (by means of the correcting sense of touch) than those of hearing. Their danger for the patient consists chiefly in the importance they gain for him by confirming his mental delusions; to have seen something with one's "own eyes" is held to furnish irrefragable proof of the actuality of the experience.

Perhaps auditory hallucinations are fraught with even graver danger for the sufferer, since they lead him to seek for explanations,[4] and thus bring delusive ideas

[1] Kraepelin, *Psychiatrie.* Erlenmeyer, in his paper read at the twenty-ninth Congress of the *Deutsch. Naturf. und Aerzte* (1852), expresses the opinion that delusions of the organic sense are of the gravest moment, especially when they spring, not from the periphery, but from the centres of the nervous system.

[2] Blumröder and Griesinger, among others, hold that visual, and Aubanel, Thore, Michéa, and v. Krafft-Ebing that auditory hallucinations are the more frequent.

[3] Schoenthal, "Beitrage z. Kentniss d. im frühen Lebensalter auftretenden Psychosen," *Arch. f. Psych.*, xviii. p. 836.

[4] All insane persons who are subject to hallucinations seek to explain them . . . then, . . . delusive ideas are developed, which naturally are closely associated with the hallucinations. (Kandinsky, "Zur Lehre von den Hallucinationen," *Arch. für Psych.*, xi.)

in their train, and since, as we have already noted, they are but rarely capable of control.[1] Indeed it is but natural that hallucinations associated with this sense, which plays so great a part in producing mental images, and exerts so far-reaching an influence upon the mind, should tend to be specially persistent and convincing.[2]

Nor is it any marvel that hallucinations in general should lead irresistibly to delusive ideas for which they themselves furnish the material, if on their first appearance they are not too foreign to the content of consciousness gained through normal perception to admit of being easily interwoven with the patient's ordinary thought,[3] and if they are distinct and plastic; or again, if they assail several senses at once and thus deprive the sufferer of every means of testing them, or come upon him in such numbers that he has not time for tedious comparisons, or if they

[1] E. Kraepelin, "Ueber Trugwahrnehmungen," *Vierteljahrsschr. f. wissensch. Philosophie*, v. p. 364. According to Griesinger, *op. cit.*, p. 100, auditory hallucinations indicate a severe affection of the brain seldom capable of cure, and are often latent for a considerable time.

[2] A. Cramer, "Die Hallucinationen im Muskelsinn bei Geisteskranken," attributes specially grave results to so-called thought-audition. The cases communicated by Klinke, "Ueber d. symptom des Gedankenlautwerdens," do not quite bear this out. In the majority of his cases, though the affection had lasted for years, dementia did not supervene. Be it added, however, that the symptoms of thought-audition were not so clearly marked in his cases as in Cramer's. (Klinke, *op. cit.*, *Arch. f. Psych.*, xxvi. i.)

[3] Kraepelin, *Psychiatrie*, 4th ed., p. 79, holds that the overwhelming power which the hallucinations exert over the mind of the patient is not chiefly due to their sensory vividness, but to their intimate connection—a connection often unsuspected by the sufferer—with his usual train of thought, and their close correspondence with his secret fears and longings. Compare Ziehen, *Psychiatrie*, pp. 28 *et seq.*

arouse violent emotions which render calm consideration impossible.[1]

While, on the one hand, hallucinations may implicate several senses simultaneously, on the other partial or "unilateral" fallacies may occur.[2] It is true that Rose has denied the existence of unilateral hallucinations, and has endeavoured to explain them away, as probably a mixture of delusion and true sensation; for instance, in one case where an insane patient was suffering from ear-ache caused by inflammation of the middle ear. But their existence ought by this time to be pretty well established. Gall relates the case of a minister of state who constantly heard insulting words whispered into his left ear; and in the more recent literature of the subject such examples are no longer rare. According to Krafft-Ebing, the unilateral voices are heard better when the other ear is closed—when, for instance, the patient is lying on it.

Fallacious Perception in Psychoneuroses.—Concerning the occurrence of hallucinations in neurasthenia[3] opinion is still divided, but there can be no

[1] G. Ackermann, *Ueber die Entwickelung von Wahnideen aus Hallucinatorischen Vorgängen* (Diss. Jena, 1892).

[2] Called "hallucinations dédoublées" by Michéa; compare, among others, Souchon, *Ueber einseitige Hallucinationen* (Diss. Berlin, 1890); Alex. Robertson, in the *Glasgow Med. Journ.*, vii. 4, pp. 196 *et seq.*, 1875. Higier, "Ueber unilaterale Hallucinationen," *Wiener Klinik.* (1894), quotes 52 cases from various sources, including Fürer's self-observations (*Centralbl. f. Nervenhlknd.*, N.F. v.). Toulouse analyses 39 of these cases, which are distributed among the various senses as follows:—Unilateral auditory hallucinations, 26; visual, 7; tactile, 1; auditory and visual together, 4; visual, auditory, and tactile, 1.

[3] Thus Falret, for instance, in the Congrès Intern. d. Méd. Ment. (Paris, 1889), maintains that imperative ideas do not occur in association with hallucinations. On the other side, compare H. Kaan, *Der Neurasthen. Angstaffect*, etc.; Séglas, *De l'obsession*, *Ann. Méd. Psych.*, vii. p. 119 (1892). Their occurrence seems to be becoming more and more recognised.

question as to their frequency in psychoneuroses. In epilepsy they are specially characteristic of the aura which precedes the attack, and though often little more than vague sense-impressions (red light in a case of Gowers', the noise of machinery in one of Bennet's), they not infrequently occur as fully developed hallucinations.[1] Generally they are of a disagreeable nature. Thus Gregory mentions the case of a patient in whom the seizure was always preceded by the apparition of a hideous old woman in a red cloak, who advanced and struck him on the head with her cane, whereupon he fell to the ground in convulsions. In another case the devil appeared in a shadowy form. Sometimes the apparitions are less frightful. Conolly tells of a patient who saw, in the last few moments before loss of consciousness, pleasant landscapes spread out before him. In other cases voices are heard. Olfactory hallucinations are also reported as occurring before the attack, or rather in the intervals between and alternating with them.[2]

[1] Compare Hagen, *Die Sinnestäuschungen*, p. 179; Bottex, *op. cit.* (feeling, smell, taste); Szafkowski, *op. cit.*, p. 149; Michéa, *op. cit.*, chap. xv., among 28 epileptics found 13 hallucinations, chiefly of hearing and sight; Blumröder, in his review of Michéa's work in *Schmidt's Jahrbüchern*, lviii. p. 118; L. Meyer, "Visionen einer Epileptischen," *Allg. Zeitschr. f. Psych.*, xiv.; Brierre de Boismont, *op. cit.*, pp. 208 *et seq.*; Billot, "Considérations sur la Symptomatologie de l'Epilepsie," *Ann. Méd. Psych.* (1843), p. 384; Griesinger, *op. cit.*, p. 411; Esquirol, *Des Maladies Mentales* (see Hunt's translation, 1845); v. Krafft-Ebing, *Lehrbuch der Psychiatrie*, 544 *et seq.*; Emminghaus, *Allgemeine Psychopathologie* (1878), pp. 346-348; M. Schunk, *Casuistische Beiträge z. epil. Psychose* (1890), pp. 6-8; Ernst Hjertström, in the *Nord. Med. Ark.*, xv. 2, No. 10 (1883), on Epileptic Insanity.

[2] Paget, in *Catal. of the Royal Coll. of Surg.*, 2128, 2129; further, *Med. Times and Gaz.*, 13th Aug. 1864, p. 168; *Lancet*, 16th June 1866; *Ophthalm. Hosp. Rep.*, v., part iv., pp. 295, 304; Griesinger, *op. cit.*, p. 100; Hughlings Jackson, *Med. Times and Gaz.* (1868), p. 231; Sander, *Arch. f. Psych.* (1873), p. 234.

In post-epileptic states (as well as in the epileptic-equivalent, which indeed many alienists regard as a post-epileptic condition), sensory delusions occur, most frequently, of course, in epileptic delirium; but they are not absent from the state of stupor, in which the wild, distraught stare and the occasional outbreaks of frenzy may be the reaction from terrifying fancies and apparitions.

Hallucinations are indeed—it may be as well to note this before proceeding further—a frequent cause of violent and criminal acts; for instance, in hallucinatory insanity, epilepsy, hysteria, and somnambulism, and especially in delirious states (alcohol, morphia, cocaine, and typhus-delirium). Thrown into a paroxysm of terror by the phantoms which threaten him, or obsessed by his "voices," the sufferer snatches up a weapon and perhaps commits a murder or sets fire to the house. Or again, despairing of escape from the enemies who pursue and mock him, he puts an end to his sufferings and his life at the same time, and often in a skilful and cunningly planned manner.[1]

Hysteria.—Hysteria, especially the "*grande hystérie*," is assailed by numerous hallucinations. Even in insane cases, where hysteria is present, these should be regarded as hysterical phenomena if they come and go with the attacks.[2] They may appear among the earliest indications of the approaching "grand

[1] Besides the various text-books, compare among older writers, for example, Asmus, "Hallucinationen," in the *Pr. Ver. Zt.* (1845), No. 50; v. Feuchtersleben, "Mord u. Irrsinn," *Damerow's Allg. Zeitschr.*, ii. 2 (1845); Cohen van Baren, "Ueber den trunkfälligen Sinnenwahn," *ibid.*, iii. 4 (1846); Michéa, *op. cit.*; Brierre de Boismont in the *Ann. d'Hyg.*, 1849.

[2] Brierre de Boismont, *Des hallucinations*, p. 213.

attaque," sometimes days before it; occasionally, too, they are mingled with illusions as a part of the true aura. As regards these premonitory sense-delusions, the curious law, formulated by Charcot,[1] of the relation of the hallucinated sense to the hemianæsthetic side, holds good. For example, the commonest visual hallucinations (in which black and red play a leading part) are black rats, cats, snakes, and spiders, shining stars, fiery spheres, and so on. But these do not remain motionless. Either they go diagonally across the patient's field of vision, in which case they proceed from the hemianæsthetic side; or else (generally) they come from behind the patient, hasten past, and disappear in the distance. In this case also the apparitions occur on the hemianæsthetic side. Auditory hallucinations also show a decided preference for this side, and the same law is said to hold true of those of the tactile sense.[2] These premonitory hallucinations haunt the sufferer even by day, but in the night they become much more persistent and vivid, and what was only a passing vision before, develops into a long scene, in which the patient is called upon to take a part. Often these scenes are of an erotic nature, and are followed by extreme exhaustion.[3]

[1] Charcot, *Le Progrès Médical* (1878), No. 3, p. 38.

[2] Paul Richer, *Études clin. sur la grande hystérie ou hystéro-épilepsie* (1885), pp. 8 *et seq.*: "Gl—— (right-side anæsthetic) sees loathsome black rats, which glide past her on the right side. Once a great black cat sprang into her lap. While walking alone she hears a voice calling her, she turns round, there is no one. While she is at her work familiar voices speak in her ear. She hears them on both sides, but chiefly on the right. Suddenly she feels herself embraced. . . . . It is noteworthy that she feels the kiss only on the right cheek."

[3] In the same way, the onanistic act in hysteria may be accompanied by vivid hallucinations. Compare Schrenck-Notzing, *Die Suggestions-Therapie, etc.*, p. 70.

In Charcot's four typical phases of the "great hysteria," hallucinations are unknown in the epileptic phase, but they are indicated in the others, and the last two especially are filled with them. In the third phase the sensory images are peculiarly vivid. Often past events which exerted an influence on the outbreak of the disease are represented, more seldom purely imaginary scenes. Pleasing and melancholy pictures emerge, now as two separate phases, and again mingled with each other. The sufferers often complain bitterly that the agreeable side of an attack is constantly shattered by horrible visions. On the whole, distress preponderates over pleasure. These hallucinations are distinguished from the hallucinations of the fourth phase, hysterical delirium, by their regular stereotyped recurrence, and also by the fact that in the delirious phase the scenes of the past are treated as memories, and it is generally the trivial events and experiences of the day which furnish forth the hallucinations,[1] though here again random rats, serpents, etc., are apt to obtrude themselves. Even after the attack has passed, many patients believe in the objective reality of the hallucinatory scenes. This throws a light on the curious circumstance that many unhappy wretches, in the times of witchcraft, confessed to all manner of strange sins, and endured with stubborn firmness all the pangs of martyrdom rather than renounce belief in their intercourse with the devil, and their participation in orgies which had taken place only in the drama of their hysterical hallucinations.

If not reckoned as true chorea, the epidemic of dancing which raged in Germany and the Netherlands in the Middle

[1] Richer, *op. cit.*, p. 120.

Ages comes under this head. Appearing in Aix in 1374, it spread in a few months to Liège, Utrecht, and the neighbouring towns, visited Metz, Cologne, and Strasburg (1418), and after lingering into the sixteenth century gradually died out. This malady consisted in convulsions, hallucinations, dancing with contortions, and so on. The attack could be checked by bandaging the abdomen, as well as by kicks and blows on that part of the body. Music had a great influence on the dancers, and for this reason music was played in the streets in order that the attacks might by this means reach a crisis and disappear the sooner. Quite trifling circumstances could bring on these seizures, the sight of pointed shoes for instance, and of the colour red, which the dancers held in horror. In order to prevent such outbreaks the wearing of pointed shoes was forbidden by the authorities. During their dance many of the afflicted thought they waded in blood, or saw heavenly visions. Of a similar nature was the mad tarantula dance of Italy which appeared about the same time.

To this category also belongs the history of demoniacal possession. The belief of being possessed by spirits, frequently met with in isolated cases, appeared at certain periods in epidemic form. Such an epidemic broke out in Brandenburg, and in Holland and Italy, in the sixteenth century, especially in the convents. In 1350-60 it attacked the convent of St. Brigitta, in Xanthen, a convent near Cologne, and others. The nuns declared that they were visited by the devil, and had carnal conversation with him. These and other "possessed" wretches were sometimes thrown into dungeons, sometimes burnt. The convent of the Ursulines at Aix was the scene of such a drama (1609-11), where two possessed nuns, tormented by all kinds of apparitions, accused a priest of witchcraft, on which charge he was burnt to death.[1] The famous case of the nuns of Loudun (1632-39)[2] led to a like tragic conclusion, as well as the Louvier case (1642), in which the two chief victims found their end in lifelong imprisonment and the stake. (See on this point, Richer, *loc. cit.*, pp. 797 *et seq.*)

[1] Calmeil, *De la folie* (1845).

[2] Pilet de la Menardière, *La Démonomanie de Loudun* (1634), also the *Histoire des Diables de Loudun* (Amsterdam, 1740); Gabr. Legué, *Urbain Grandier et les Possédées de Loudun* (1880).

Ecstasy.—It is but a step from hallucinations of this description to those of ecstasy. Brierre de Boismont, Piesse, and others, distinguish between morbid and physiological ecstasy, the latter occurring only in rare instances—in the cases of prophets, saints, and philosophers, for instance. Michéa, Baillarger, and Moreau describe it as always a pathological phenomenon, and Charcot, Richer, and others relate it with hysteria, especially with the third phase of the hystero-epileptic attack. Hallucinations are a constant phenomenon of ecstasy, where they arise out of one-sided mental activity and intense concentration on single groups of ideas, conjoined with lowered sensibility.[1] The best known cases are those of religious ecstasy, but religious ideas do not invariably furnish the material for "ecstatic vision." Philosophers, artists, and others whose habit of mind tends to deepen certain channels of thought, are also liable to such visitations. Any and every object of longing or desire, no matter how trivial, grotesque, or perverse, may become the object of ecstasy.[2] Owing to the persistent euphoria associated with this state, and the ease with which the psychical processes act, ecstatic visions and hallucinations are almost invariably of an agreeable nature. The subjects of these experiences mourn the short duration of their happiness, and tell with rapture of the heavenly bliss and unspeakable delight which they enjoy, of the

[1] Michéa, "Extase," in the *N. D. de Méd. et de Chir. Prat.*

[2] Spitta, *Der Schlaf. u. die Traumzustände d. Menschl. Seele*, p. 123. Considering how deeply religion is rooted in the mind of the child, and also that hypermnesia is usually attributed to somnambulic states, and that in the third phase of the hystero-epileptic attack visions from the past play a leading part, the frequent occurrence of religious ecstasy in persons otherwise indifferent to religion is not to be wondered at.

wondrous visions vouchsafed to them, and the converse they have held with angelic visitors. Sometimes, indeed, they speak of awful phantoms. The famous Emanuel Swedenborg was privileged to behold God himself. Engelbrecht relates how he was carried by the Holy Spirit through space to the gates of hell, and then borne in a golden chariot up into heaven, where he saw choirs of saints and angels singing round the throne, and received a message from God, delivered to him by an angel. The many familiar examples of ecstatic visions in the Old and New Testaments may be cited, as well as those found in the legends of the saints and martyrs, where they either appear as revelations from heaven or temptations of the devil. In the latter case the close connection of religious ecstasy with sexual disturbance is indicated.[1] Legendary lore and the sacred books of all nations teem with revelations and visions, and profane history furnishes us with a series of such examples (the Crusades, Joan of Arc, etc.). Even in our own time—besides the cases to be found in asylums—an "ecstatic maid" sometimes makes her appearance here and there, exercising a powerful effect upon the minds of small, and sometimes even of large communities.

Among the great number of cases reported those of Marie de Moerl and Louise Lateau are the most celebrated. The former passed her life in continual contemplation of the life and sufferings of Christ. Her visions were indicated by her attitude and the expression of her countenance. Thus at Christmas time she seemed to hold the new-born babe in her arms, at Epiphany she worshipped it on her knees, enacting the adoration of the Magi, and on Holy Thursday she attended the marriage of Cana, etc. She also represented the Passion and death on the cross. Louise Lateau related that at the beginning

[1] Krafft-Ebing, *Psychop. sexual*, p. 91.

of the ecstasy there appeared to her a great and blinding light, and soon after certain forms became visible to her eyes, and the various scenes of the Passion passed in order before her. She would describe them briefly, but with singular clearness. She beheld the Saviour, whose person, garments, wound prints, cross, and crown of thorns she described. He took no notice of her, she said, neither looked at her nor spoke. She described with the same terse clearness the folk about him, apostles, holy women, and Jews.[1]

Among Eastern and primitive peoples, such as Hindoos, American Indians, natives of Greenland, Kamtschatka and Yucatan, fetish-worshipping Negroes, and Polynesians, the ecstatic state, accompanied with hallucinations, is frequently observed, sometimes arising spontaneously, but more often artificially induced. It was also known among the nations of antiquity. The means most often employed to induce this state are beating of magic drums and blowing on trumpets, howlings and hour-long prayers, dancing, flagellation, convulsive movements and contortions, asceticism, fasting, and sexual abstinence. Recourse is also had to narcotics to bring about the desired result. Thus the fly agaric[2] is used by the inhabitants of Tunguska (Western Siberia), in San Domingo the herb coca, tobacco by some tribes of American Indians, and in the East opium, and haschisch, a preparation of Indian hemp. Even the ancient Egyptians had their intoxicating drinks, and

[1] Dr. F. Lefebvre, *Louise Lateau;* compare also Dr. Bourneville, *Science et miracle: Louise Lateau ou la stigmatisée belge;* Warlomont, *Rapport méd. sur la stigmatisée de Bois d'Haine;* Charbonnier-Debatty, *Maladies et facultés diverses des mystiques;* H. Boëns, *Nouvelles de Louise Lateau;* Gluge in the *Gaz. hbdm.*, 1875, 23; Crocq in the *Gaz. hbdm.*, 1875, 27, 29, 37; Semal, *Étude sur les stigmatisées*, etc.; Denneux in the *Presse méd.*, xxvii. 34.

[2] A mushroom common in Kamtschatka and Siberia.

receipts for witches' salves and philtres have come down to us from mediæval times.[1]

Hallucinations in States of Intoxication.—The cases we have just noted lead us on to those hallucinations which occur without any initiatory phase of psychical exaltation, in states of simple intoxication. To discuss all the various intoxicants and compare their effects would lead us too far and involve needless repetitions, I shall therefore confine myself here to the more important.

The form of inebriation best known to us is that which follows on the inordinate consumption of alcoholic liquor. The illusions characteristic of this state are to be explained for the most part in the manner indicated in Chapter I. The hallucinations associated with them are generally of a depressing nature, and terrifying impressions predominate. True, sweet voices are sometimes heard, melodies delight the ear, and fair landscapes appear before the eyes, but this seldom lasts long, monsters and serpents take the place of flowers, and the visions shift about and are mingled together. Vermin, reptiles, etc., appear in great numbers, such for instance as the rats,[2] cats, snakes, mice, and monkeys which fill the visions

[1] Schrenck-Notzing, *Ueber Suggestion und suggestive Zustände*, a lecture delivered before the Anthropol. Gesellsch., Munich, 1893; Prosper Alpin, *De medicina Aegyptiorum;* P. Radestock, *Schlaf und Traum* (1879), pp. 29 *et seq.;* Julius Thomsen, "Die Berauschungsmittel der Menschen," *Oppenh. Zeitschr.*, xliv. 2 and 4 (1850); B. Seeman in the *Pharm. Journ. and Trans.*, Oct. 1851; M. Perty, *Die mystischen Erscheinungen d. menschl. Natur.* (2nd edit.), vol. i. pp. 90, 91.

[2] It has been plausibly suggested that the legend of Bishop Hatto, who vainly sought refuge in the "Mouse-tower" on the Rhine from the rats and mice which swarmed about him, might be referred to such an origin. Certainly from rats of this phantom breed neither stream nor tower can defend.

of *delirium tremens*.[1] Thus Brierre de Boismont[2] found among twenty-one cases—three of them severe—twenty in which hallucinations of vermin and such creatures were seen swarming over the bed and up the walls.[3] Other sensory delusions of a purely fantastic nature are not lacking. Sometimes black men appear who grimace and threaten, then climb the walls, or vanish up the chimney. In other cases the visions arise out of the daily occupations of the patient, or out of his past experience.

The patient "peers into all the corners and behind the doors, lifts imaginary objects from the ground, shakes them and throws them down again, stamps and scrapes with his foot on the

[1] Similar results are reported from the abuse of cocain, salicylic acid, etc. Compare Krafft-Ebing, *Lehrbuch der Psychiatrie*, pp. 218 *et seq.*

[2] *Des hallucinations*, p. 174.

[3] Günsburg opposes this view, "Ueber Delirium potatorum," *Günsb. Zeitschr.*, ii. 4 (1851), and maintains that in at least 30 per cent. of such cases only "subjective phenomena" occur which are to be compared with "creeping of the skin." The visual hallucinations (which according to Wolff, *Annalen d. Charité zu Berlin*, 1850, also occur as forerunners of *delirium tremens*) are explained as an illusory perception of various entoptic phenomena by C. G. Chaddock in the *Alienist and Neurologist*, Jan. 1892. He holds that the visual delusions caused by perverse perception, which are constant and almost pathognomonic phenomena of alcoholic delirium, take the form of animals because the entoptic processes generally imply movements (*e.g.*, the pulsations of the blood-vessels in the retina), and for us the idea of moving objects is almost inseparably associated with living creatures. Hoppe, indeed, has denied any appearance of independent movement in entoptic phenomena, except their darting into the field of vision. But if the sudden darting of entoptical phenomena into the field of vision and their swift disappearance be admitted, Chaddock's view and Hoppe's observations are really in accord. Be it noted that Truchsess had already inferred ("Ueber Delirium tremens," *Würt. Corresp.-Blatt*, 1844, No. 39) from the uniformity of the delirium in such cases, and from the fact that the sufferer's attention might be diverted from his delirious visions, that one of the lower centres was affected in the first case, causing a secondary implication of the higher centres.

ground as though crushing an insect, brushes his hand over his face and attempts to blow away cobwebs and hairs which he feels about him. Suddenly he claps his hand to his thigh and pinches his trousers hard, in order, as he says, to crush a huge black spider which is crawling up him. . . . He hears his friends and calls to them—hears their voices raised in altercation . . . and endeavours to hasten to them. . . . Now his right hand approaches his knees, which are drawn together and slightly raised. He imagines he is holding a pigeon on his knee and feeding it with grain. Then he thinks he is in the market-place, and shouts to the crowd of folk. He sees men dressed like savages defile past him on a rope."[1] In another case the victim "seeks to escape his enemies by flying to the woods. He hears the noise of waterfalls round him, then sees the town hall all lighted up, hears music and singing and sees panoramas. Red lanterns swing from the trees, he runs, he flees, and all these phantasmagoria follow him. Crosses appear to him and sparks of light. . . ." He tells how he heard voices urging him to suicide. "The waterfalls called to me and said, 'You are too cowardly to throw yourself in,'"[2] etc.

Dreams of flames and conflagrations are a frequent result of the abuse of alcohol. They are generally of a visual nature, but sometimes the other senses share in them. Thus Weber relates in his *Demokritos* that after a punch-party such a fire-dream visited him in the form of an auditory hallucination: "I thought I heard the fire-alarm and ran to the window, annoyed at not hearing the sound of the fire-hose," and so on.

The effect of absinth in producing sensory delirium is very similar, but its unmixed action can seldom be observed, as the absinth drinker of course imbibes the alcohol which is mixed with the liqueur, and generally indulges in other spirituous drinks as well. But here also fiery visions, rats, serpents, etc., are reported, as

[1] Magnan, *De l'alcoolisme, des diverses formes du délire alcoolique et de leur traitement* (Paris, 1874), p. 49.

[2] *Ibid.*, p. 75.

well as auditory hallucinations of a startling and terrifying nature.[1] The same is true of atropin-intoxication (red-vision after many eye-operations[2]), and of belladonna. *Datura stramonium* produces distressing visions and dreams, associated with feelings of oppression[3] and vertigo;[4] crowds dance round the sufferer, and seek to whirl him away in their aimless movements. Robbers and murderers try to kill him; a thousand hideous faces and gigantic forms encircle him. Boerhaave, on the other hand, states that small doses of belladonna and datura stramonium induce erotic visions and hallucinations. The sensory delusions following on the use of the fly agaric[5] are of a depressing nature, and this is also true of those appearing in mercury[6] and lead-poisoning.[7]

In the intoxication produced by chloroform, which is specially rapid in its effects (Kraepelin), the hallucinations are of an unpleasant nature.[8] Those accompanying ether-intoxication, on the other hand, are

[1] *Ibid.*, pp. 87 and 116.

[2] Hilbert, *Klin. Monatsblätter f. Augenheilk*, xxiv. p. 483; see above, p. 8, Note 2.

[3] Spitta, *op. cit.*, p. 282.

[4] Brierre de Boismont, *Des hall.*, p. 446. Compare Delasiauve in the *Rev. méd.* (Dec. 1850).

[5] Brierre de Boismont, *op. cit.*, p. 448, Note.

[6] Kussmaul, *Untersuchungen über den constanten Mercurialismus* (1861), p. 266; Emminghaus, *Allg. Psychopathol.* (1878), p. 369.

[7] Boureau in *Ann. méd.-psych.* (1854); Popp in *Bayer. ärztl. Int.-Bl.*, xxi. 38, p. 357; Bottentuit in *L'Union* (1873), 151; *Würt. Corresp.-Bl.*, xliii. 38 (1873); Bartens, "Geisteskrankh. nach Bleivergift.," *Allg. Zeitschr. f. Psych.*, xxxii. 1; Em. Régis in *Ann. méd.-psych.* (Sept. 1880).

[8] Spitta, *op. cit.*, p. 282: "The power of feeling pain is destroyed by chloroform, but the remnant of the purely ideational element is sufficient to produce analogous mental images." Compare the case described in detail by Spencer in his *Principles of Psychology*, appendix to vol. i.

said to be highly pleasurable.[1] The action of haschisch, smoked by the Persians, or drunk in the form of "majoun," consumed by the Turks in the form of a sweetmeat mixed with almonds (*damawesk*), or mixed with brandy (*iraki*), in Algiers made into a paste with honey (*madjund*), and to which many other peoples are passionately addicted, has been exhaustively investigated by Moreau, besides other observers.[2] Among the eight phenomena of haschisch intoxication (called by the Arabs "kief") reported by him, we find delirious visions and intensely pleasurable sensations. But these blissful feelings are by no means undisturbed. Terror and dismay break in upon the dreamer,[3] and the inevitable rats, etc., make their appearance.[4] Generally speaking, however, the sensory delusions of this narcotic are of a pleasurable nature, glimpses of paradise, heavenly bliss, etc.[5] Colours often appear preternaturally bright and vivid. A peculiarity of haschisch-delirium is the perpetually recurring conviction of the unreality of the hallucinatory drama.[6]

1 Dieffenbach, *Der Æther gegen den Schmerz* (1847). According to Richer, *op. cit.*, hystero-epileptics are thrown into the third phase of the "grande hystérie" by the inhalation of æther; Bones (of Nîmes), on the other hand, observed (*Gaz. des Hôp.*, 1861) the calming effect produced by it in hysterical convulsions; C. A. Ewald, "Ein Ætherathmer," *Berl. Klin. Wochenschr.*, 1875, 11.

2 Moreau, *Du Haschisch et de l'Aliénation mentale*, 1845.

3 Brierre de Boismont, *op. cit.*, pp. 444 *et seq.*

4 Moreau, *op. cit.*, pp. 84 *et seq.*

5 A celebrated instance is the influence of haschisch on the Islamite order of Abdallah Megalis el Hiemit, the members of which enjoyed the pleasures of paradise in their ecstasies, and urged thereby to a fanatical courage, became a terror to Christendom.

6 Moreau, *op. cit.*; Schrenck-Notzing, "Die Bedeutung narcotischer Mittel f. d. Hypnose," *Schriften d. Ges. f. psych. Forsch.*, i. pp. 57, 58. Polli in *St. Andrews Med. Grad. Assoc. Trans.*, iii. p. 90,

Santonin is found to produce chiefly delusions of taste and smell,[1] and with cinchona (Peruvian bark) auditory hallucinations predominate, though other sensory fallacies also occur.[2] Hallucinations of an erotic nature are attributed to opium, but when habitual indulgence has rendered it a necessity, and the dose must be continually increased, a frightful period of torment commences.[3] Similarly, nitrous oxide ("laughing-gas") tends to produce hallucinations of an erotic nature—a fact which perhaps may help to explain the many charges brought against dentists, afterwards proved to be unfounded.

These details, which accord with the usual view of the subject, must nevertheless be supplemented by pointing out that the specific action of the poison, which indeed frequently produces quite

reports that subjects who had taken haschisch felt as though one half of their ego were sensible while the other half raved like a fool, and they were conscious of a like condition in their neighbours. Gauthier, *Étude clinique sur l'absynthisme chronique* (1882), says the intoxication is not continuous, "it seizes you and lets you go again, lifts you up to heaven and carries you back to earth, and that without any gradual transition." For further information on the subject see Rech in *Journ. de Montp.* (Dec. 1847); Dorvault in *Bull. de thérap.* (Oct. 1848); Moreau in *Gaz. de Hôp.* (1856); Ch. Judée, *ibid.* (1855), 70; Schroff, *Wiener Wochenbl.* (1857), 40, 41; W. Watts Campbell in *Med. Times and Gaz.* (1863); Kuijkendael in *Philad. Med. and Surg. Rep.*, xxxii. (1875), p. 421; Freusberg, *Ueber die Sinnestäuschungen im Hanfrausch;* N. Lange, "Ueber die Wirkung des Haschisch, psych. Bem.," *Fragen d. Psych. u. Phil.*, i. (1889).

[1] A. Mayer, *Die Sinnestäuschungen, Hallucinationen und Illusionen* (1869), p. 108; W. Preyer, *Die fünf Sinne des Menschen* (1879), p. 66.

[2] Briquet, comp. Dietl in *Wien. Wochenschr.* (1852), 47-50.

[3] Thomas de Quincey, *Confessions of an English Opium-Eater*, describes his sensations as follows:—"And now came a tremendous change. . . . Hitherto the human face had often mixed in my dreams, but not despotically nor with any special power of tormenting. But now that affection which I have called the tyranny of the human face

opposite effects upon the mind, is only one of the factors in the building up of sensory delusions. Another consists, as we shall point out, in the sensory impressions to which the intoxicated subject is exposed. He assimilates these in the same way that a sleeper assimilates them, as we shall see when we come to discuss dreams. That is to say, he either apprehends them to start with through a veil of illusion, or he perceives them correctly, but builds upon them a hallucinatory superstructure.

But the most important factor must, after all, be the personal reaction. This is broadly indicated by the fact that, while one individual may appear in nowise affected, another under the influence of the same narcotic may become delirious and experience

began to unfold itself . . . now it was that upon the rocking waters of the ocean the human face began to reveal itself; the sea appeared paved with innumerable faces upturned to the heavens, faces imploring, wrathful, despairing, faces that surged upwards by thousands, by myriads, by generations: infinite was my agitation; my mind tossed, as it seemed, upon the billowy ocean, and weltered upon the weltering waves.

". . . It appeared to me that I was in bed and had awakened. In leaning on my hand in order to adjust my pillow, something soft seemed to give way beneath it. It was a corpse stretched by my side. I was, however, neither alarmed nor astonished. I took it in my arms and carried it into an adjoining room, saying to myself: 'I will lay it there on the floor; it is impossible that it can come in again, if I take the key out of the door.' Upon that I slept again, and was again aroused. It was by the noise of an opening door; and this idea filled me with a horrible sensation. Then I saw the same dead body come in which I had carried away. Its action was singular; it was that of a man whose bones had been taken out, and who, in his endeavours to support himself by his pliant, flexible muscles, was ready to fall at each step. However, it succeeded in reaching me, and stretched itself upon me. It then became a horrible nightmare, inexpressibly disgusting; for, besides the weight of the formless mass, a pestilential odour arose from the kisses with which it covered me," and so on.

hallucinations; and is shown further the development of the sensory delusions, which may assume different forms, with similar narcotics and like sensory influences, according to the idiosyncrasy of the percipient and the feeling of the moment. "When we expose two individuals at the same moment to the same influence," says Schleiermacher, "the result will be different in each case, and the cause of the difference will be not merely that each perceives something different, but that each has his individual way of assimilating to his mental organism the raw material supplied from without, and that this mental organism is different in every case." For instance, a pessimist being easily depressed inclines towards melancholy delusions, or a person of erotic tendencies will be haunted by voluptuous visions. It is not improbable that opium and haschisch owe their reputation to the fact that they are the narcotics of the Orientals. In the course of our inquiry we shall return to deal more fully with the influence of this factor on the development of fallacious perception.

Fallacies of Perception in acute Somatic Disorders.—With the hallucinations already considered, those appearing in the course of acute somatic diseases, and as a result of them, seem naturally to be classed.[1] Here, as in the delirious states associated with intoxication, the swarming of the hallucinations is character-

[1] Compare, for this section, E. Mendel, "Die Psychosen im Gefolge acuter somatischer Erkrankungen," *Deutsch. méd. Zeitschr.*, vii. 19 (1880); *idem*, "Das Delirium acutum," *Berl. Klin. Wochenschrift* (1894), No. 24; E. Kraepelin, "Ueber den Einfluss acuter Krankheiten auf die Entstehung von Geisteskrankheiten," *Arch. f. Psych.*, xi., xii.; F. C. Müller, *Ueber psych. Erkrank. bei acuten fieberhaften Krankheiten* (Diss. Kiel, 1881); G. Aschaffenburg, *Allg. Ztschr. f. Psych.*, LII., i. p. 75

istic. This resemblance is not accidental. Indeed the delirious states of somatic disease may, in part at least, be referred to intoxication. But of no less importance are the rise of temperature, acceleration of metabolic processes, and disturbances of circulation in the brain cavity (first, active hyperæmia; later, in enfeebled action of the heart, venous stasis), the importance of which is indicated in typhus, for instance, by the parallelism between the violence of the delirium and the temperature curve. The initial hallucinatory visions of typhus, small-pox, and intermittent fever, occurring before the other causes have had time to act, are on the other hand to be attributed to the direct influence of the specific virus of the fever, as also the afebrile delusions, sometimes occurring in intermittent fever in place of the fever attack, and the visual and auditory hallucinations which are observed in small-pox between the eruptive fever and the fever of the suppurating stage.

Hallucinations also occur in the decline of the disease, during the period of convalescence.[1] First they appear singly, in association with those of the fever, and are often recognised by the patient as such and concealed from those around him. But soon they overmaster the sufferer, and delirious states are developed, or states resembling hallucinatory insanity, in which visions of corpses, death's-heads, mocking voices, and offensive olfactory and gustatory hallucinations play a part. Of an equally distressing nature are most of the sensory fallacies of collapse-delirium, and those which sometimes precede death. In tuberculosis, on the other hand, they are often of an agreeable nature, cor-

[1] Thore in *Ann. méd.-psych.*, April 1856; *ibid.*, 1860, p. 168.

responding to the euphoria which is so characteristic of this disease.

Sensory Delusions of the Dream-state.—We now pass to fallacies of perception in sleep and dreams, which even in olden times, by reason of their frequency and their universal range, could not fail to arouse curiosity and offer occasion for manifold hypotheses.[1] Their importance in ethnology has been fully vindicated by Radestock.[2] According to the usual classification, they are divided into hallucinations, or dreams induced by association of ideas, and illusions, or dreams induced by nerve stimulation (Spitta). In the first case their content is said to be formed from images which attain prominence because the emotions, ideas, and perceptions which dominate

[1] Leaving out of account the great mass of older literature, the following works appear to me important for the elucidation of the subject: —Macnish, *The Philosophy of Sleep* (1830); Jan, *Der Schlaf* (1836); Purkinje, "Wachen, Schlaf, Träume und verwandte Zustände," in Wagner's *Handwörterb. d. Physiologie* (1846); Buchholz, *Ueber den Schlaf und die verwandten Zustände desselben;* Lemoine, *Du sommeil au point de vue physiol. et psychol.* (1855); Maury, *Du sommeil et des rêves;* also, "De certains faits, etc.," *Ann. méd.-psych.* (1857, April); Jessen, *Versuch einer wissenschaftlichen Begründung der Psycholog.* (1855), II. Abschn. 2, Cap. 1; Scherner, *Das Leben des Traumes* (1861); Jensen, *Träume und Denken;* van Erk, *Ueber den Unterschied von Traum und Wachen* (1874); L. Strümpell, *Natur und Entstehung der Träume* (1874); Volkelt, *Die Traumphantasie* (1875); Hildebrandt, *Der Traum und seine Verwerthung fürs Leben* (1875); Siebeck, *Ueber Schlaf und Traum* (1877); C. Binz, *Ueber den Traum* (1878); Siebert, *Ueber Schlaf und Traum* (1878); Giessler, *Aus den Tiefen des Traumlebens.* But the most useful of all are: Spitta, *Die Schlaf- und Traum-zustände der menschlichen Seele* (2 Auflage 1892), and especially P. Radestock, *Schlaf und Traum* (1879); Delbœuf, "Le sommeil et les rêves," in the *Rev. philosoph.* (1879-80); Weygandt, *Entstehung der Träume* (1893); and Mourly-Vold, "Expériences sur les Rêves," *Revue de l'Hypnotisme*, Jan. 1896.

[2] *Op. cit.*, Cap. I.

the consciousness during the waking state are blotted out, allowing the ideas kept under by them, and long struggling to arise, to emerge above the threshold of consciousness—a process which Aristotle compares to the emergence of a frog frozen in the ice, and Radestock to the appearance of the stars after sunset. Often, it is said, old memories (from youth's "golden age") or wishes, still active, or cherished long ago, are realised in these visions.

One individual re-visited in a dream the playground of his youth and his youth's companions. Shortly after he returned in the flesh to his native place, from which he had been absent for many years, and reported that he found everything as it had appeared to him in the dream, except that his friends had grown older. A man-servant, who had failed to attain his cherished ambition of becoming a soldier, was consoled by dreams of military glory, and while by day he blacked boots, by night he commanded a regiment.[1]

To this class (Spitta's *Associationsträume*) belong many of the dreams which reveal things of which we were not conscious whilst awake.

Thus Maury dreamed of the, to him, unknown town, Mussidan, and that some one told him it was in the department of Dordogne. On waking he looked it up, and found that his dream-informant was correct. Abercrombie[2] tells how a friend of his, who was employed as cashier in a Glasgow bank, was enabled through information received in a dream to correct an error of long standing, for which he had vainly sought to account in making up his books at the close of the year. He also gives another case in which a father appeared to his son in a dream, and named a witness who could testify to a certain payment made by him before his death. For this sum the son was then being prosecuted, and though he was convinced that the claim was

[1] Radestock, *op. cit.*, p. 138.

[2] Abercrombie, *Inquiries concerning the Intellectual Powers*, pp. 280-288.

unjust, he had hitherto failed to find any proof in his favour. But the apparition mentioned a trifling circumstance which had occurred in connection with the payment, and which later proved to be of great importance, for the witness had forgotten all about the transaction till the mention of this little incident called up the whole scene to his mind.

Professor Reubold (of Würzburg) tells of a young betrothed couple who, after hastily clearing the table in order to write an important letter, found that a watch which had been lying on the table had disappeared. All search proved fruitless, but a week later the man dreamed that it was in the outer breast-pocket of the coat he had been wearing at the time, and there the watch was found.[1]

It is clear that in all these cases it is not a question of new knowledge, but of the emergence in the dream-state of an apparently forgotten impression. We shall encounter such phenomena frequently.

Let us now pass to the other group, the illusions (Spitta's *Nervenreizträume*) brought about by external stimuli which, as in the waking state, reach us through all the ordinary channels of sense. Perhaps, as the eyes are closed, they reach us on the whole less through the visual sense, yet lightning, moonlight, and sunlight not infrequently exercise an influence on the imagery of our dreams.

Krauss[2] relates that he once caught himself, on waking, in an amorous attitude, with his arms stretched out towards the opposite window, in which the image of his absent mistress appeared. When fully awake, this image resolved itself into the full moon. Scherner dreamed once, when the morning sun streamed into his room, that a fiery dragon was rushing upon him. Suddenly the dragon retreated, and on waking he found

[1] Taken from the *Münchner Neuest. Nachrichten* (1896), No. 138.
[2] Krauss, *Der Sinn im Wahnsinn.*

that clouds had hidden the sun. Weygandt dreamed of "living pictures" suddenly seen in a blaze of magnesium light. In this case the morning sun had just broken through the clouds.

Besides these external influences acting on the eye, changes taking place in the visual organ itself are to be noted. I pass them over here, however, as we shall encounter them later on, when we come to discuss the theory of hallucination.

The sensory stimuli which reach us through the ear are of great importance in the formation of dream-images.

The banging of a door or the noise of an overturned chair may involve us in a dream-duel, ending in the loud report of a pistol. When a child, Maury fell asleep one day of great heat, and dreamed that his head lay on an anvil and was being smitten with a blacksmith's hammer; yet it was not crushed; it melted away to water. On awaking he found himself bathed in sweat, and heard from the neighbouring smithy the sound of the blacksmith's hammer. Weygandt dreamed on a railway journey, when the engine whistled, of a girl who was screaming and crying shrilly because she was being scolded. "Between sleeping and waking this morning I perceived a dog running about in a field (an ideal white and tan sporting dog, etc.), and the next moment I heard a dog barking outside the window. Keeping my closed eyes on the vision, I found that it came and went with the barking of the dog outside."[1]

The part played in building up dream-images by the two senses of smell and taste is not so easy to indicate. While visual stimuli in far the greater number of cases give rise to visual hallucinations, and noises, etc., generally induce hallucinations of hearing, it rarely happens that the dreams which spring from olfactory and gustatory stimuli bear any qualitative relation to their exciting causes. Thus

[1] *Phantasms of the Living*, i. p. 474.

strong odours, flower-scents, heavily perfumed handkerchiefs or soap, have an unpleasant effect upon the dreamer, causing oppressed breathing, with its accompanying dreams, but seldom give rise to percepts normally associated with such scents. These do, however, sometimes occur, as in the case of the individual who directed his servant to sprinkle his pillow sometimes after he was asleep (leaving the choice of the particular night to the servant) with a perfume which he had only used during a certain stay in the country, but to which he had then taken a great fancy. On those nights he visited again in his dreams the scenes associated in his mind with the perfume. The occurrence of imaginary tastes and smells in dreams is very rare, so much so that it has been altogether denied by many observers. Still a few cases have been reported.[1]

Sensations of pressure, temperature, and of the cutaneous sensibility in general are among the chief causes of dreams.

The bedcover pressing on the arm is embraced as a mistress, or felt as a heavy weight; a dream of being impaled, that is to say, of standing on a stake, the point of which was thrust through the foot, has been known to arise from the pressure of a straw lodged between the toes; a covering which has slipped to the ground is sometimes a source of great embarrassment, when it causes us to dream of appearing half clad in the street or at a social gathering; or it may call up visions of skating, Alpine travels, Polar expeditions, and these again may suddenly end in the feeling of falling into a gulf, due to a slight alteration of the sleeper's position in bed.[2] Gregory, when he had a hot-water

[1] Sully, *Illusions* (1881), p. 144. In the case quoted by Weygandt, *op. cit.*, pp. 47 *et seq.*, the olfactory stimulus was perceived objectively, and therefore can hardly be called an olfactory dream.

[2] Savage, *op. cit.*, p. 129.

bottle at his feet, dreamed that he was climbing Etna[1] and walking on hot lava. Purkinje says: "If our hand has become numb by pressure, in the dream-state it may appear as something strange and gruesome touching us, and if the whole side is affected, we imagine that a strange bedfellow, whom we cannot get rid of, is stretched beside us."[1]

Besides arising out of these and similar external influences, our dreams often spring from feelings connected with the bodily organs themselves, for in the dream-state the "organic sense" of our waking life is split up into its constituent parts, and separate feelings due to slight irregularities or disturbances of the functions easily become elements in the dream-consciousness.[2] Thus, for example, the dream of having a tooth extracted may originate in an incipient toothache, which perhaps twenty-four hours later may become sufficiently intense to affect the waking consciousness. Irregularity of the heart's action, difficulty in breathing, an uncomfortable

[1] According to J. Mourly-Vold, "Expériences sur les Rêves, etc.," *Revue de l'Hypnotisme*, Jan. 1896, the influence of position during sleep is generally exhibited in one of the following ways:—(1) The position of a member may be perceived more or less correctly, but suggest an attitude; for instance, if the foot is stretched and bent back it suggests the dream of standing on tip-toe to reach something; (2) the strained position may be taken to be part of a movement, and the dreamer seem to be dancing on his toes; (3) the movements may appear to be executed by some one else; (4) sometimes the movements seem to be impeded; (5) the affected member may be changed in the dream into some animal or inanimate object of analogous form; (6) sometimes the dream-perception of the member gives rise to abstract ideas, which it symbolises; for instance, the perception of several fingers may give rise to dreams of numbers and calculations.

[2] Of these constituent parts in relation to the character of dreams, Weygandt has experimentally investigated sensations of fatigue, indigestion, fulness of the bladder, free and restricted breathing, the circulation, and the sense of equilibrium. The influence of sexual excitation could also be easily proved.

position, and errors of diet are the not infrequent causes of distressing dreams.

Thus Herrmann, when suffering from an attack of colic, dreamed that his abdomen was opened, and an operation performed on the sympathetic nerve. Others dream of going up for examinations. The house-wife dreams she is giving a party, and that all her dainties are burnt up, and so on.

To the causes just mentioned (Schech also mentions nasal polypus) is to be referred nightmare[1] (also called incubus, succubus, and night-hag), which has played no small part in the development of dæmonology, the belief in vampires, witches, and so on. For naturally the character of the dream imagery does not depend only on the stimuli which started it, but also on the intellectual and emotional idiosyncrasies of the dreamer (Radestock). Accordingly, the dream-images accompanying the stimuli, or rather originated by them, differ widely in different persons, and this is also true of the further secondary fallacies of perception which associate themselves with these primary illusions. Generally speaking, however, we may assume that in the majority of cases externally associated images are

[1] M. Strahl, *Der Alp, sein Wesen and seine Heilung* (1833), with a bibliography of the older works; Albers, *Beobachtungen auf dem Gebiet d r Pathologie*, iii. p. 59 (1840); Boerner, *Das Alpdrücken, seine Begründung und Verhütung* (1855); Binz, *op. cit.* In a *vivâ voce* communication from Dr. C. F. Müller I obtained the following:—A mediæval superstition explained incubus, vampires, etc., as the fruit of unnatural intercourse between man and beast, and was formally expressed up to the beginning of our century by the fact that the legal punishment for this offence, death by fire, was inflicted only when such intercourse was proved to have been consummated. In such cases the animal was also burnt, or otherwise put out of the way, a proceeding partaking more of the nature of self-protection than of punishment.

reproduced, even when such pronounced cases as the following have to be classed as exceptions.

Maury once dreamed that he made a pilgrimage (*pèlerinage*) to Jerusalem, then found himself in the presence of the chemist *Pelletier*, who gave him a shovel (*pelle*). Another time he dreamed first of *kilometres*, then of *kilograms*, the island *Gilolo*, the flower *lobelia*, General *Lopez*, and a party of *loto*. An acquaintance once told him that he dreamed he was in the *Jardin des Plantes*, and there met the traveller *Chardin*, who gave him a book by *Jules Janin*.

The dependence of dreams on particular stimuli is best shown by experiments; new conditions may be artificially introduced, and the dream may then be compared with the means employed.[1]

When water was dropped into the open mouth of a sleeper, he dreamed that he was swimming, and made the corresponding motions. A light silk handkerchief laid over the mouth and nose produced the dream of being buried alive. A mustard-plaster laid on the head caused the subject to dream of being scalped by Indians; and so on.[2]

Fallacious Perception in Hypnosis. — Dreams ex-

[1] Self-experiment, and the repetition of the same experiment in order to induce a dream experienced before under like conditions, is a less trustworthy method. (Compare Spitta, *op. cit.*, p. 227.) The train of thought which is started in the waking state, while we are preparing for the experiment, is likely to act as a *pre-hypnotic* suggestion. As examples of this kind of self-suggestion are comparatively rare in the literature of the subject, I venture to cite one here. A shoemaker with whom I sometimes experimented begged me to give him a suggestion which would cure him of the bad habit of oversleeping himself. Although by an oversight the suggestion was not given while he was in the hypnotic trance, the pre-hypnotic auto-suggestion proved sufficient for the purpose; at least a fortnight later he had not once failed to respond to the summons of the early morning bell, which he had not heard for years before.

[2] Spitta, *op. cit.*, p. 278; Boerner, *op. cit.*; Weygandt, *op. cit.*; and others.

perimentally induced during sleep in the manner above described lead us naturally to those of the hypnotic state, and indeed they are in some cases not to be distinguished from them—in cases, that is to say, where in normal sleep the hallucinations correspond directly to distinct verbal suggestions. The classic instance is that furnished by Abercrombie of the officers who, by whispering in their sleeping comrade's ear, made him go through all the incidents of a duel, from the challenge to the final pistol-shot. Beattie gives similar cases. The numerous examples supplied by the literature of hypnotism render it superfluous to cite further experiments here, for instances like the above in nowise differ from the ordinary phenomena of hypnotic suggestion. The suggested hallucinations of hypnosis are to be distinguished, however, from the fallacies of perception discussed in the preceding paragraph, where the stimulus which is elaborated into a dream-illusion is but dimly and vaguely felt by the sleeper, where the sound of words addressed to him, for instance, only reaches his dreaming ear as a murmur, so that he imagines himself walking by a murmuring stream, or among trees soughing in the wind. But in the cases with which we are now concerned, spoken words are clearly distinguished from other sounds, are intelligently perceived, and produce their appropriate dream-images.

As, however, this direct dramatic response to verbal suggestion had rarely been observed except in hypnosis, and in that state could be very easily produced, it came to be regarded as a typical hypnotic phenomenon, and the distinction drawn by Spitta between sleep and hypnosis was generally

accepted.[1] According to him, "normal" sleep is less pervious to external influences than the alert "artificially induced" state of the hypnotised subject. In the former case, he says, the suggested dream depends on the operator only at its commencement, and is continued quite independently by the "automatic action" of the brain.

This is no doubt true of the greater number of suggested dreams in sleep, for in the first place the experimenter wishes, as a rule, to study the results of a single isolated impression, and refrains from confusing it by adding other suggestions, and the further course of the dream is abandoned to the guidance of cerebral automatism, or becomes modified by incalculable accidents; while, on the other hand, the dream of the hypnotic subject is generally guided by a series of suggestions. Secondly, the suggestions given to the normal sleeper have usually been vague and elementary in character (pressure, cold, touch, light, etc.). He interprets these mistakenly, and it is difficult for the experimenter to guide further a dream of which he does not know the content.[2] In most hypnotic experiments definite suggestions are given, and though the subject does indeed develop them in his own way, still the experimenter remains in closer touch with him. Thus the difference is not a fundamental one, but is conditioned by the difference in the amount of experimental interference; moreover, there are cases on record, like those cited by Abercrombie and Beattie, where the experimenter

[1] Spitta, *op. cit.*, p. 130.

[2] How important it is for the operator to be in touch with the content of the subject's dream is shown by Moll, *Rapport in der Hypnose*, p. 308 (36), Case 21.

was able to guide as he liked the dream of a normal sleeper.

On the other hand, there are cases where the hypnotic dream depends but little on the direct influence of the operator, when only a vague suggestion is given. Suppose a march is played on the piano without any verbal suggestion being added, the subject may, as likely as not, look out of an imaginary window and watch a phantom band march past with fife and drum. Again, the suggested dream of hypnosis may be carried on by the subject independently. Let the experimenter but refrain from breaking in with new suggestions, let him leave the subject to his own devices, and the opportunity will be afforded him of watching the unfolding of a continued dream.

This was very well shown in the case of a gardener-lad with whom I experimented. After a series of experiments, I left him to himself for some time smoking a "suggested" pipe, while I noted down my observations. Suddenly he snatched this imaginary pipe out of his mouth, made a horrid grimace, and proceeded to spit out imaginary tobacco juice, with signs of lively disgust.

Nor is the well-known phenomenon called "*déroulement*" anything more than a vivid continued dream. It consists in this, that often on a slight and accidental incitement, and sometimes very much against the intention of the experimenter, a long or short series of scenes from a former state of hypnosis are automatically reproduced.

A similar phenomenon is the *objectivation des types*, when the subject develops a mental delusion suggested by the operator in association with various hallucinations and illusions which are interwoven with it.

Furthermore, it is a fact that in hypnosis, exactly as in sleep, spontaneous hallucinations and illusions occur. Sometimes they are so lively, as in the case of "mediums" and "magnetic" somnambulists, that the experimenter ceases to exert any power over them at all; in other cases he may be able to guide them to some extent, and at least he is generally able to break the chain of associated ideas at any moment by suggestion and cause them to disappear. Bernheim quotes two cases,[1] and though he mentions this type of somnambulism but seldom, it is nevertheless to be met with quite frequently in cases where the experimenter contents himself with watching the course of a dream which is not "acted out," but which runs on like the dreams of ordinary sleep, and occurs oftenest when the subject is left to himself. On account of this tendency of the hypnotic dream to run on, Ringier has urged[2] that, in the therapeutic practice of hypnotism, it is unadvisable to leave the patient long alone without from time to time repeating the curative suggestion.

Generally speaking, the similarity which exists between the hallucinations of hypnosis and of sleep extends to those of the post-hypnotic state. But it should be noted that while in the majority of cases the appearance of the suggested hallu-

[1] Bernheim, *De la Suggestion*, pp. 64-67. (*Suggestive Therapeutics.* From the French. New York and London, 1889.)

[2] Ringier, *Erfolge des therapeutischen Hypnotismus in der Landpraxis*, pp. 95 *et seq.*

[3] Though the auto-suggestive continuation and spontaneous origin of sensory delusions can be so easily observed in hypnosis, it may not be superfluous to emphasize their occurrence here, since Ochorowicz still thought it necessary to question it in the programme of the Psychophysiological Congress in Paris.

cination is sufficient to induce a more or less pronounced hypnoid condition, there are other subjects who, while responding to the suggestion, remain to all appearance in the normal state.[1] Such cases recall the hallucinations of paranoia, which are also characterised by the maintenance of consciousness, and here as there the percipient is in nowise confused, and while experiencing hallucinations may perhaps be engaged in a lively conversation with those around him.

Frau U., an innkeeper's wife, 45 years of age, an extremely suggestible subject (so much so that while awake a mere assurance that she could not move her limbs deprived her of all power of movement), was hypnotised by me, and the post-hypnotic suggestion given that each time A., who was present, should cough, a fly would alight on her brow. The hallucination was realised; at each cough of A.'s she raised her hand to her forehead and looked up into the air as though watching a fly. This did not prevent her, however, from continuing with animation her conversation with me on the preparations for her daughter's approaching marriage. Her prompt reaction to suggestions given in ordinary life rendered her post-hypnotic suggestibility valueless as a test of her state of consciousness.

Bernheim communicates the following case of a young girl, of unusual intelligence, and free from hysterical tendency[2]:—"I arranged that on waking she should see an imaginary rose. She saw it, touched and smelt it, and described it to me; but knowing that I might have given her a suggestion, she asked me if the rose was a real or imaginary one, adding that it was quite impossible for her to tell the difference. I told her that it was imaginary. She believed me, and yet found that by no effort of the will could she make it disappear. 'I can still see and touch it,' she said, 'as though it were natural; and if you were to show me a real rose beside it, or instead of it, I should not be able to tell the one from the other.' All this

[1] Gurney in the *Proceedings of the S.P.R.*, 1887; see note, p. 307.
[2] Bernheim, *op. cit.*, p. 38.

time she was thoroughly awake, and talked quietly with me about the apparition."

Crystal-visions.—The class of hallucinations which we shall now proceed to discuss, those known as "crystal-visions,"[1] also seem to occur in full normal-consciousness. These visions may be experimentally induced as follows. The percipient strives to banish all conscious thought from his mind, and fixes his gaze continuously on a "Braid's crystal," a burning glass in a dark frame, a glass of water or some similar reflecting object.[2] Many persons after gazing thus for some time begin to see pictures in the crystal, the spire of the parish church perhaps, or familiar faces.

The art of crystal-gazing has been practised from very early times.[3] Divination by means of crystals and various reflecting objects (such as metal mirrors, beryl stones and other gems, vessels containing water, wells and springs, liquid poured into the palm of the hand, oiled finger-nails, etc.) was practised by the Assyrians, Persians, Egyptians, and in Greece, Rome, China, India, and Japan, not to speak of the cup-divination among the South Sea Islanders. This art, whose discovery Æschylus attributed to Prometheus, Cicero to the Assyrians, Zoroaster to Ahriman, and the Fathers of the Church to the Father of Lies, reached its highest development in the sixteenth and seventeenth centuries, and found its exponents among the learned physicians and mathematicians of the Courts of Elizabeth, the Italian Princes, Catherine de Medici, and the Emperors Maximilian and Rudolph. As all the various methods of mirror

[1] Compare "Recent Experiments in Crystal-Vision," *Proceed. of the Soc. f. Psych. Res.*, vol. v. (1888-89), pp. 486 *et seq.*; Myers, "The Subliminal Consciousness," *id.*, vol. viii. (1892), p. 472; Rells, *Psychol. Skizzen* (1893), p. 1.

[2] C. G. Carus reports a case where fixed gazing at the shining lock of a door gave rise to hallucinations.

[3] For the historical part, see "Recent Experiments, etc.;" Kiesewetter, *Faust in der Geschichte und Tradition, etc.* (1893); and *München akad. Monatshefte* (1890), vol. 78-82.

or crystal divination resemble each other closely in many ways, —for instance, in laying stress on the condition that the seer should be a child "who had not known sin,"—suffice it in this short glance at the history of the subject to take the description written in Egypt by an eye-witness, Lane.[1] His curiosity was excited by Mr. Salt, the English Consul-General, who, on suspecting his servants of theft, sent for a magician. Mr. Salt himself selected a boy as seer, while the magician occupied himself with writing charms on pieces of paper which, with incense and perfumes, were afterwards burned in a brazier of charcoal; then, drawing a diagram in the boy's right palm, into the middle of which he poured some ink, he bade him look fixedly into it. After various visions had come and gone, the form of the guilty person appeared to the boy, and was recognised by the description he gave. On being arrested the thief thus strangely convicted confessed his crime.

This incident prompted Lane to further inquiries, and other results, of which he gives a very full account, were obtained. On one occasion the magician wrote certain invocations on paper, summoning his two genii, then added a verse from the Koran, "to open the boy's eyes in a supernatural manner . . to make his sight pierce into what is to us the invisible world." These were burnt in a chafing dish containing live charcoal, with frankincense and various spices, etc. A boy of eight or nine years old had been chosen at random from a number who happened to be passing in the street, and the magician, taking hold of his right hand drew in the palm a magic square, that is to say one square inscribed within another, and in the space between certain Arabic numerals; then, pouring ink into the centre, bade the boy look into it attentively. At first he could only see the face of the magician; but proceeding with his inspection while the other continued to drop written invocations into the chafing-dish, he at length described a man sweeping with a broom, then a scene in which flags and soldiers appeared; and finally Lane asked that Nelson should be called for. The boy described a man in European clothes of dark blue, who had lost his left arm, but added, on looking more intently, "No, it

[1] Lane, *Customs of the Modern Egyptians* (1833-35), I. cap. 12. Compare a similar description in Burke's *Anecdotes of the Aristocracy and Episodes of Ancestral History*, vol. i. p. 124.

is placed to his breast." Lord Nelson generally had an empty sleeve attached to the breast of his coat, but, as it was the *right* arm he had lost, Lane adds: "Without saying that I suspected the boy had made a mistake, I asked the magician whether the objects appeared in the ink as if actually before the eyes, or as if in a glass, which makes the right appear left. He answered they appeared as in a mirror. This rendered the boy's description faultless."

Among the Greeks, besides crystal-gazing strictly so-called, other methods of divination by reflection were used. There was *hydromancy*, which was practised chiefly at Patræ, where the fountain before the temple of Demeter delivered oracles. The manner of consulting it was this: a mirror was let down by a small cord into the fountain, so that it just touched the surface of the water, and from the various figures and images which appeared upon it, divination was made. Then there was *lecanomancy*, in which a bowl containing water, or a mixture of oil and wine, took the place of the crystal; *catoptromancy*,[1] in which metal mirrors were used; *gastromancy*, in which with certain incantations a boy was appointed to observe the middle point (γαστηρ) of a glass vessel full of water, surrounded by torches; lastly, *onychomancy*, performed by the oiled finger nails of an unpolluted boy. There can be little doubt that the cup of Joseph, "in which my lord drinketh, and whereby indeed he divineth," was used for such magical purposes.[2]

Numerous instances of divination by mirror or crystal-gazing occurred among the Romans. In the writings of St. Thomas Aquinas, and others of the Fathers, the art is condemned as devilish in its origin, but in spite of saintly malisons, in spite of a special condemnation from the Faculty of Theology in Paris (1398), the Specularii continued to flourish. Pico de Mirandola (1463-94), himself a foe to astrologers, who had declared his death in his thirty-second year, was a firm believer in mirror-visions.

[1] Practised by Septimius Severus and Julian the Apostate, among others. Bodinus, *Dæmonomania*, and Fromman, *De Fascinatione* (1676), p. 727, report the like of Catherine de Medici.

[2] Genesis xliv. 5. Compare also the names of two of the stones on the breastplate which the high priest wore when he went before the Lord—Johalam and Ahaloma (*halam* = vision), Exodus xxviii. 19, 20.

Johann Rist, the accomplished mathematician and scholar, tells of a wonderful crystal made by Wysbro in Augsburg; and seventeenth century writers frequently refer to a famous crystal at Nuremberg, by which even a scientific problem is reported to have been solved! In England, in the middle of the sixteenth century, Dr. Dee, famous for his crystal visions and prophecies, flourished at the court of Elizabeth. He has left behind him a chronicle of his experiences in a very readable book. The story is well known of the prophecy which revealed to the Duke of Orleans the fate of the princes through whose death he became Regent of France.

In legends and fairy tales too the magic-mirror often figures (Snowwhite's "little mirror on the wall;" *The Arabian Nights*); and the theme has passed into modern literature, in the fairy tales of Musæus, Fouqué's "Zauberring," etc.

Some of the crystal-visions obtained in the manner above described are held by those who report them to be telepathic or "veridical." I shall not discuss these here, however, as we must first come to some conclusion on telepathy itself. By far the greatest number deal with memory-pictures, and not a few reproduce visual impressions which have not penetrated to the "upper consciousness" (Dessoir's *Oberbewusstsein*,[1] Myers' *supra-liminal consciousness*), or externalise ideas which, to keep to the same terminology, were latent in the percipient's *sub-liminal* consciousness. The reproduction of a visual impression which had apparently "dropped out" is well illustrated by the following example:—[2]

"I had carelessly destroyed a letter without preserving the address of my correspondent. I knew the county, and searching in a map recognised the name of the town, one unfamiliar to me, but which I was sure I should know when I saw it.

[1] M. Dessoir, *Das Doppel-ich.*

[2] "Recent Experiments in Crystal-Vision," from which account the following examples are taken.

But I had no clue to the name of house or street, till at last it struck me to test the value of the crystal as a means of recalling forgotten knowledge. A very short inspection supplied me with 'H—— House' (the entire word in grey letters on a white ground), and having nothing better to suggest from any other source, I risked posting my letter to the address so strangely supplied. A day or two brought me an answer, headed 'H—— House,' in grey letters on a white ground."[1]

A similar case is that of the appearance in the crystal of a newspaper paragraph announcing the decease of an acquaintance, whose illness and death were unknown to the percipient. It happened, however, that she had been interrupted the day before while reading the first sheet of the *Times*, and the paragraph, almost word for word as it had appeared in the crystal, was discovered just where she had broken off. The visual impression of the words had been received, but had never reached the percipient's consciousness, and now emerged as a hallucination.[2]

[1] In another case the information obtained through the crystal was false.

[2] That in such cases there is no need to speak of a subconscious "intelligence" is shown by those examples in which the impression subconsciously received is wholly destitute of ideational quality, and is therefore reproduced hallucinatorily as a pure sense impression. Thus a lady saw in the crystal the following letters appear one after another, *detnawaenoemosotniojaetavirpelcric*, and so on, which apparently meaningless message was at length discovered to be the reproduction of a newspaper paragraph: "Wanted a some one to join a private circle," etc., each word being spelt backward separately. Such a senseless reproduction of visual impressions, associated only by mere external sequence, is often met with in automatic writing. This occurs most frequently as "mirror-script"; or, as I have myself observed, planchette sometimes writes *boustrophedon*, that is to say from left to right in the ordinary way, and back again from right to left in "mirror-script." Another illustration is to be found in the anagrams produced by automatic writing. (See the case of "Clelia" in the *Proc. of the S.P.R.*, 1883-84, p. 226.) So there is absolutely no need to postulate, like Du Prel, special mysteries and laws of the "spirit-world."

The part played by association in this reproduction is shown in the following case :—

"One of my earliest experiences was a picture, perplexing and wholly unexpected—a quaint oak chair, an old hand, a worn black coat-sleeve resting on the arm of the chair,—slowly recognised as the recollection of a room in a country vicarage, which I had not entered and but seldom recalled since I was a child of ten. But whence came this vision, what association had conjured up this picture? . . . At length the clue was found. I had that day been reading in Dante, first enjoyed with the help of our dear old vicar many a year ago."

If we now pass to the visions of the second class, the externalisation of latent ideas, we find that, as in hypnotism, the image may be awakened by the sound of an associated word, and rise to the level of a hallucinatory perception. Exactly in the same way in crystal-vision it may be excited by a related visual impression, a printed word for instance, consciously or unconsciously received, and may under favourable conditions be projected in the form of a hallucination, like the frozen music in Baron Munchhausen's posthorn, which could be *thawed out* in a warm room and set merrily sounding. Thus Miss X., the writer on crystal-vision in the *Proceedings*, tells how she cut the pages of a book without reading it, and soon after, on looking into the crystal, saw first a rocky coast, which was afterwards nearly eclipsed by the image of a large mouse. Two days later, on taking up the same volume to read it, a couple of lines which caught her eye seemed somehow familiar—

"Only the sea intoning,
Only the wainscoat mouse,"

and she concluded that these words, unconsciously read before, had suggested the visions. On another

occasion it was shown that a puzzling vision of the corner of a room decorated in green, white, and red stripes, was to be explained by a letter recently received from a friend who was having her house redecorated, and wrote that the staircase had just been painted, and "looked at present like a Neapolitan ice."

From my own experiments I select the following:—A hypnotised subject, A., received the post-hypnotic suggestion that he could not open the door of the room or go out through the open door. When awakened he was absolutely amnestic. An experiment in crystal-vision, made after twenty-five minutes' talk, yielded the pentagram; on a second experiment being made, the word "*Drudenfuss*" (Anglicè, *pentagram*) appeared in Roman characters. The first two letters were so indistinctly written that A. could only read "*udenfuss*" at first, and arrived at the word through trying various combinations. Even then he continued to complain that the "*Dr*" was hardly legible.

The last example which I shall give is again taken from Miss X.'s account, and seems to me of special interest, as illustrating how purely abstract conceptions may give rise to concrete images.

"On March 20th I happened to want the date of Ptolemy Philadelphus, which I could not recall, though feeling sure that I knew it, and that I associated it with some event of importance. When looking in the crystal some hours later I found a picture of an old man, with long white hair and beard, dressed like a Lyceum Shylock, and busy writing in a large book with tarnished massive clasps. I wondered much who he was and what he could possibly be doing, and thought it a good opportunity of carrying out a suggestion which had been made to me, of examining objects in the crystal with a magnifying-glass. The glass revealed to me that my old gentleman was writing in Greek, though the lines faded away as I looked, all but the characters he had last traced, the Latin numerals LXX. Then it flashed into my mind that he was one of the Jewish elders at work on the Septuagint, and that its date, 277 B.C., would

serve equally well for Ptolemy Philadelphus! It may be worth while to add, though the fact was not in my conscious memory at the moment, that I had once learned a chronology on a mnemonic system which substituted letters for figures, and that the memoria technica for this date was 'Now Jewish Elders indite a Greek copy.'"

Just as visual images may be called up by gazing on a shining object, so by placing a sea-shell to the ear it is possible to induce auditory hallucinations. I therefore class such hallucinations with crystal-visions, which they resemble in their content. This analogy is borne out by cases like that of the lady who, if she listened to the shell after a dinner-party generally heard repeated, not the conversation of her "lawful interlocutor," to which her attention had been directed, but the talk of her neighbours on the other side, which she had not consciously noted at the time.[1]

The history of divination by voice-oracles and sounds takes us, like crystal-vision, to remote countries and legendary times. Dodona had its murmuring grove, and, coming to a later date, we read of shell-divination as practised by the Thibetan Buddhists, by the Chinese, and by other Eastern folks, while even to this day the Hungarian gipsies listen for the voice of the Nivasha, or Spirit of the Air, in the sea-shell. That this art was familiar to the necromancers of the Middle Ages is indicated by a passage in Paracelsus.[2] Some experiments are reported by Spitta,[3] who fastened up a bell of about twenty inches in diameter in a large and lofty room,

[1] Myers, "The Subliminal Consciousness," *Proc. of the Soc. f. Psych. Res.*, vol. viii. p. 493.

[2] Paracelsus, *Archidoxorum*, L. 6.

[3] Spitta, *op. cit.*, p. 293.

from which he excluded the light. He then struck the bell several times gently on the rim with a sort of drum-stick covered with a cloth. While straining his ear to catch the last faint reverberations he found that he was able to call up auditory delusions. The only one which he has recorded, however, is founded upon an illusory interpretation of the sound of the bell.

Dissociation of Consciousness the common Characteristic of all these States.—If we now cast a glance back at the matter which we have been considering in this chapter, and seek for some quality common to all the various states in which hallucinations occur, we shall find that their most striking characteristic is the *dissociation of consciousness.* Obstructed association is indicated in almost every case. In melancholia it is "not the energy of the psychical processes which is abnormally feeble, but the resistance which is abnormally great."[1] In mania, indeed, there would seem to be a swifter on-rush of ideas. In alcohol-delirium however, which, besides its many other resemblances to mania,[2] exhibits a quickened flow of verbal images, it is seen that this is accompanied by a slowing down of the actual work of thinking.[3] "It would seem, therefore, that there is free play of mental images when the intellectual factor gives place to those motor elements which arise out of mere verbal naming. This would at least explain the want of unity in the train of thought frequently

[1] Kraepelin, *Psychiatrie*, p. 292.

[2] Compare the parallel drawn by Griesinger between alcohol-delirium and mania, *op. cit.*, § 144.

[3] See Kraepelin, *Ueber die Beeinflussung einfach. psych. Vorgänge durch einige Arzneimittel* (1892).

to be observed under such circumstances, and the prominence of purely external auditory associations. The patient babbles senselessly, because the flow of verbal images is accelerated, while the association of ideas is impeded."[1] Since the hereditarily degenerate are so liable to hallucinations, that some patients seem to see and hear everything they think, and cannot shake off the deceptions of which they are conscious,[2] we must suppose that the higher neural elements are in their case easily exhausted, so that their state resembles that which follows on prolonged fasting,[3] or where, from whatever cause, inanition, with its attendant hallucinations, is present.[4]

It is unnecessary to emphasise the point further with regard to the hallucinations accompanying hysteria, epilepsy, states of intoxication, fever-delirium and sleep,[5] or indeed with regard to those occurring in hypnosis, notwithstanding the rare cases of post-hypnotic hallucinations in which a disturbance of consciousness has not been observed or proved. In crystal-vision, freedom from conscious thought or mental pre-occupation is an essential condition.[6]

Whilst laying stress upon this common element we

[1] Kraepelin, *Psychiatrie*, pp. 280, 281.

[2] Lange, *Om Arvelighendens Indflydelse i Sinsygdomene* (1883).

[3] For instance, as a preparation for ecstasy.

[4] Becquet, *Arch. gén.* 6, Sér. VII., pp. 169, 303 (1866), says that the delirium of inanition is mild, and the accompanying hallucinations not of a terrifying nature.

[5] For the grounds for assuming a partial dissociation in the hallucinations of paranoia, especially of the auditory type, see later.

[6] "Miss X" states that during her experiments in crystal-vision her consciousness was in every way quite normal, but the expressions used by the writer of the letter, published in another article by "Miss X" (*Proc. S.P.R.*, vol. i., March 1895, p. 132), about the latter's "uncanny" and "fixed" look, and her "dreamy, far-away tone," make these statements appear somewhat paradoxical.

do not seek in any way to underrate the differences between the various states in which sense-deceptions may occur. Indeed, these differences are shown clearly enough in the character of the hallucinations, not so much as regards their content, as in the manner of their occurrence. Thus the strongly-marked, vividly-externalised hallucination of mono-mania is self-contained, and changing but slowly, differs widely from the unstable hallucination of the hysterical subject, which springs like his mental delusions from obscure sensations, and owing to the transitory nature of the exciting cause generally possesses little permanence. In general paralysis the loss of the critical faculties and power of judgment, caused by the lapse of the higher mental functions, which expresses itself in absurd and aimless babble, is reflected also in the character of the hallucinations; whilst in mania nothing is more striking than the superficiality of the sensory delusions, and their liability to change their character, as indicated by the way in which the patient will laughingly contradict his own statements of the moment before.

It is clear that the state of dissociation is not always the same. Rather we find an endless series of gradations from the deepest stages of beclouded consciousness to one which is hardly to be distinguished from the normal; or, to express it differently, from the slightest indications of obstructed association to its almost complete inhibition; or from the profound cleavage of consciousness to the mere splitting off of single elements, or small groups of elements. — The more complete the obstruction of the association paths, and the deeper the disturbance of consciousness, the more numerous are the sensory

delusions (as in collapse and fever-delirium, for instance), and the less likely are they to be remembered. Thus, states of profound disturbance of consciousness, like epilepsy and deep sleep, are subjectively described as dreamless; whilst states of only slightly disturbed consciousness, for instance, the periods of transition between sleeping and waking, are regarded as favourable to the occurrence of sensory delusions (hypnagogic and hypnopompic hallucinations). It is natural, therefore, that the occurrence of hallucinations should be reported, not only in such transition states between sleeping and waking when in bed at night, or during the afternoon siesta, but also in analogous states otherwise produced. The performance of automatic movements, for instance, such as the monotonous tramping on a long walk or march, often induces such a condition.

In the winter of 1814 Herr Prus had left the regiment to which he was attached to visit his family, who lived about two leagues off. He relates his experiences as follows:—"I had hardly walked one league in the extreme cold when I noticed that my condition was no longer normal. I walked mechanically, and my body seemed to me strangely light. I knew well the cause and the danger of this state, and tried to hasten my steps, but in vain. Worse still, my eyes kept closing in spite of all my efforts. Then delightful visions visited me. I seemed to be in a beautiful garden, and saw trees, lawns, and streams," etc.[1]

But the on-coming of this hypnoid state is seldom so amenable to observation as in the case just quoted. It generally eludes self-observation. In some cases, like the following, a disturbance of the waking con-

[1] Brierre de Boismont, *Des Hallucinations*, p. 349. He mentions also the visions, sometimes gay, sometimes melancholy, which haunted the soldiers of the Grande Armée on the retreat from Moscow.

sciousness is indicated, though it is not subjectively perceived.

R—— states[1]:—"I started from Lucerne on the 2nd Nov., 1861, intending to cross over to Glarus by the pass called the Mutterthal. Lightly clad, with broken boots, bleeding feet wrapped in clouts, and only a few sous in my pocket, but trusting in God, I set forth and had climbed for about an hour when a snowstorm came on, and it became impossible either to proceed or to turn back. It seemed to me that I should certainly die there, and my whole life passed before me in a few minutes. I saw all my friends and folk at home. Then the strap of my knapsack broke, I saw it roll down into the abyss, and I gave myself up for lost. How well it was with me then I cannot describe. I saw heaven opened. In the evening I found myself with some kind folk in a hut, but how I got there I know not, nor whether I ran or flew, and, strange to say, my knapsack had been restored to me."

Such accounts show, what also appears from observations on the hypnotic state, that the dissociation may be very profound though it cannot be proved so clearly as in the above example. For instance, a medical man told me that during his tours among the Bavarian and Tyrolese Alps he enjoyed a special pleasure in the auditory hallucinations which accompanied him on his solitary excursions whenever he climbed above a certain height. Yet he seems to have had no inkling of what these phenomena signified. The point illustrated by these cases should, at all events, never be lost sight of in the discussion of hallucinations reported as occurring in the waking state; for if a man imagines that he is awake, he will naturally feel that his actions and conduct are rational, and will in all good faith so

[1] *Stat. Fragebogen d. Munch. Sammlung*, Bog. 38. See Perty, *op. cit.*, i. p. 88, for the account of a similar experience which happened to a certain Peter Stucki. Also *Journal S.P.R.*, Jan. 1889, p. 12.

describe them, but an attentive study of such cases reveals more or less certain indications of dissociation of consciousness. What these indications are we shall see later, when, for instance, we come to consider the twenty-six cases of "waking-hallucinations" cited in proof of telepathy in the "Report on the Census." (*Proceedings of the S.P.R.*, vol. x., August 1894, pp. 211-241.)

Such sensory delusions as those experienced in the case of the physician quoted above may nevertheless be regarded, especially if they occur singly and sporadically, as transitional forms to the class of hallucinations which have lately formed the subject of an extended international inquiry, the results of which, consisting as they do of entirely new material, appear to call for special consideration.

CHAPTER III.

WAKING HALLUCINATIONS AND THE RESULT OF THE INTERNATIONAL CENSUS.

Early Accounts—The International Census—General Results—Sex, Age, Nationality, and State of Health of the Percipients—Their so-called "Waking" State really one of Dissociation—Indications of this in the Narratives—Why such Indications are sometimes wanting—Hallucinations classified according to the Sense affected—The less startling Hallucinations are soon forgotten.

Early Accounts of Waking Hallucinations.—Numerous accounts have come down to us even from classical times of "waking hallucinations" experienced by sane persons. It is sufficient to mention here a few of the most celebrated.[1]

Socrates,[2] as we learn both from Plato and Xenophon, was often restrained and admonished by an inner voice when he, or one of his friends, was about to do something undesirable or displeasing to the god. The case of Timarchus (Plato, *Theages*) is the most dramatic of these warnings. Timarchus was sitting at supper with Socrates, and rose to go out to a

[1] Most of the cases given here are taken from Brierre de Boismont, *Des hallucinations;* C. Lombroso, *L'Uomo di Genio* (English ed., *The Man of Genius,* 1891); and Perty, *op. cit.*

[2] Lélut, *Du Démon de Socrate* (new edition, 1856); Myers, "The Dæmon of Socrates," *Proc. S.P.R.* (June 1889,) p. 538. Bodinus mentions in his *Dæmonomania* a similar case of an acquaintance of his who felt a touch on his right ear when setting about some good or auspicious act, and on his left if the undertaking were evil or unlucky.

plot of assassination, to which plot only one other man was privy. "'What say you, Socrates?' said Timarchus, 'do you continue drinking; I must go out some whither, but will return in a little, if so I may.' And the voice came to me; and I said to him, 'By no means rise from the table; for the accustomed divine sign has come to me.' And he stayed. And after a time again he got up to go, and said, 'I must be gone, Socrates!' And the sign came to me again, and again I made him stay. And the third time, determining that I should not see, he rose and said nought to me, and my mind was turned elsewhere; and thus he went forth and was gone, and did that which was to be his doom."

Athenodorus, the philosopher, saw a spectre in a house in Athens. On the following day he informed the magistrates, who caused the place to be searched, and a skeleton was found buried in the spot where the spectre had disappeared. During one part of his career Descartes was constantly followed by an invisible being who urged him not to abandon his search after truth. On the completion of his book *De Veritate*, Lord Herbert of Cherbury received a sign of approval from heaven. Cardan had a guardian spirit which interposed to prevent him lapsing into error; and Pascal, after a fall, saw a black gulf always at his feet. The materialist Hobbes was continually haunted in the dark by the faces of the dead. The philosopher Krause frequently from his fifth to his sixth year, and occasionally also in later life, heard a voice utter the words, "Remember death."

Out of religious history I select the four following examples:—Savonarola saw visions even in his early youth; and later on he saw heaven opened and the

appearance of a sword, upon which was written, "*Gladius Domini super terram.*" Luther was subject to numerous auditory and visual delusions. In the church at Wittenberg and on the Sacred Stairs at Rome he seemed to hear the words, "The just shall live by faith;" and often enough midnight found him disputing with the devil on knotty points of doctrine. But Audin[1] is of opinion, arguing from the feebleness of Luther's replies, that the whole dispute must have taken place in a dream. Not less subject to hallucinations was Luther's great opponent Loyola, for to him the Virgin appeared, and celestial voices encouraged his projects and fired his zeal. It was in obedience to a "divine voice" which told him to "forsake all and be a stranger to all," that George Fox, the founder of the Quaker sect, left his family and friends. When distressed at finding no support on any side, he was consoled by a voice which said, "Jesus Christ understands thee."

Tacitus[2] relates how Curtius Rufus, when only a gladiator's son, was visited by the apparition of a glorious female form, who informed him that he should become Proconsul of Africa. Oliver Cromwell also had his future greatness foretold to him by an apparition. Drusus, on one of his campaigns, was turned back from crossing the Rhine by a gigantic form which appeared to him; Julian the Apostate beheld on the eve of his death the genius of the empire flying from him in consternation; and it was not so much veneration for Leo that checked Attila's march upon Rome, as the vision of an old man in

[1] Audin, *Geschichte d. Lebens, d. Lehren u. Schriften Dr. M. Luthers.*

[2] Tacitus, *Ann.* xi. 21.

priest's raiment who threatened his death with a drawn sword.

Plutarch[1] tells the story of Bessus the parricide who, like Shakespeare's Macbeth, was haunted by the personified voice of conscience. One day, when sitting at a banquet with his friends and parasites he suddenly became inattentive to their flatteries, sprang up, and seizing his sword, struck at a nest full of young swallows and killed the poor birds, because, said he, they dared to reproach him with the murder of his father. Theodoric the Great, overwhelmed with remorse because he had consented to the death of Symmachus, one day uttered a cry of horror when a new kind of fish was served at his table, for he imagined he saw, not the head of the fish, but that of the unfortunate senator.[2] Manoury, who was chosen to examine Grandier on the charge of witchcraft (see p. 37, Note 2), tortured his victim with ruthless barbarity. Soon after he saw the spirit of the dead Grandier before him, and thereupon fell into a frenzy and died raving mad. After the massacre of St. Bartholomew, Charles IX. took his favourite physician aside and begged him to find some means to deliver him from the phantoms of the victims which constantly haunted him.

A vision of the Madonna was granted to the painter Raphael, when he had been vainly striving to picture her features with his mind's eye and fix them on the canvas. After Spinello had painted "The Fall of Lucifer" he was visited by the devil in person, who reproached him bitterly with making him look so frightful. The painter Montana saw the pictures

[1] Plutarch, *De sera numinis vindicta.*

[2] Procopius, *De bello Italico.*

he was about to paint so vividly before him, that if any one got between him and the phantasmal scene or figure he would ask them to stand aside. It is told of another popular portrait-painter that he only required one sitting from his model, and afterwards completed the portrait from the hallucinatory image which he was able to call up at his will. Benvenuto Cellini relates how a voice spoke to him in prison and withheld him from suicide. This auditory hallucination was in his case the starting-point of other sensory fallacies. Tasso was vexed by many strange delusions, and Byron was often haunted by spectres. After receiving the news of Byron's death, Walter Scott suddenly saw his friend's image before him. Astonished at the natural appearance of the clothes, he approached the phantom and discovered that it was an illusion, and that the clothes of the figure consisted of the folds of a curtain. Schumann suffered from auditory hallucinations and imagined that Beethoven dictated to him the melodies which he composed. Talma confided to a friend that often when acting with most force and brilliancy he saw the theatre filled with an audience of skeletons in place of living playgoers.

This mass of old material consists for the most part of picturesque cases like those quoted above, more satisfactory to the *raconteur* than to the student. The sensory delusions of Luther, Tasso, and Schumann may certainly be referred to neurotic or psychopathic states of which the presence is also indicated by other symptoms, but the narratives are in general so confused and contradictory, and so seldom come to us at first hand, that it is difficult to arrive at any satisfactory conclusions about them. Until lately it was

not even possible to say with certainty whether hallucinations were exceptional or quite frequent phenomena of the waking state.

The International Census of Waking Hallucinations.—Of a very different evidential value is the material which we have now to consider. A statistical inquiry on the subject was first undertaken by Edmund Gurney.[1] Later on the inquiry was approved by the Paris Congress for Psycho-Physiology; and for the valuable results of the present census we have chiefly to thank the English Society for Psychical Research.[2] The source from which I shall mainly quote these results will be the *Report on the Census of Hallucinations*[3]—a model of clearness, accuracy, and indefatigable industry,—which analyses and elucidates in various ways the answers received to the thousands of circulars which were sent out on the "Nature and Frequency of the Occurrence of Hallucinations in the Sane." Besides the tables published in the Report, I have availed myself of those communicated to the London International Congress for Experimental Psychology.[4] Further, in addition to the *ad interim* reports published from time to time during the pro-

[1] See *Phantasms of the Living.*

[2] To which I shall henceforward refer as the "S.P.R."

[3] Published by Professor Henry Sidgwick's Committee in the *Proceedings of the S.P.R.*, vol. x., Aug. 1894, and to which I shall henceforth refer as "the Report."

[4] These tables do not agree figure for figure with those of the Report, owing to the fact that in preparing the "Report" it was found necessary to make some changes in the methods of calculation. The earlier tables, however, have here often been used, as the changes are not of very great importance, and as the French and American results are still before us only in their provisional form. The reports of the Munich section are here published for the first time. (Compare Appendix I.)

gress of the inquiry, I have sought to incorporate, as far as possible, the results of the census carried on at the same time and for the same purpose in America (by William James), in France (by L. Marillier), and in Germany (under the guidance of Von Schrenck-Notzing, by the Munich section[1] of the Gesellschaft für psychologische Forschung).[2]

The question put to all persons included in the inquiry was: "*Have you ever, when believing yourself to be completely awake, had a vivid impression of seeing or being touched by a living being or inanimate object, or of hearing a voice; which impression, so far as you could discover, was not due to any external physical cause?*"

In answer to the question, 27,329 answers in all were received (see Table I.), of which 24,058 were negative and 3271, or 11.96 per cent., affirmative; that is to say, 3271 persons stated that they had experienced hallucinations. Though a certain proportion of these cases might be explained away, as due to mistaken identity, for instance, or in the case of auditory phenomena, to the real banging of a door or creaking of furniture, and such like, still, when we consider the high percentage of results, and the careful investigation of individual cases (on which we may depend in the case of the English collectors especially), it is impossible to doubt that the frequent occurrence of so-called "waking hallucinations" is proved.

Sex of the Informants.—Little information is given

[1] The results of the Berlin section were forwarded to the English Committee, and doubtless have been incorporated with their Report.

[2] Compare throughout this chapter the tables in Appendix II.

as to the persons who were the subjects of the experiences. The first fact that strikes us is the difference between the two sexes in the percentage of persons who had experienced hallucinations (in men 9.75, in women 14.56). It is unfortunate that this division of the two sexes was not carried further, as it might have led to interesting results in the tables which deal with the age of the percipients. Be that as it may, the general conclusion of the Report, that this apparent difference should to a great extent be attributed to the fact that men, among the pressing interests and occupations of their lives, forget these experiences sooner, may on the whole be regarded as satisfactory.

Age. — With regard to age, hallucinations are reported as occurring most frequently (I quote here specially from the English table, which is the most complete) between 15 and 30 years of age, more than half (52 per cent.) being experienced during this period. The lustrum from 20 to 25 yields the highest percentage of all—over 21 per cent.; while after that their frequency diminishes in a regular curve.[1] These figures must not of course be taken as expressing a proportion which holds true absolutely; they refer only to the number of hallucinations communicated as occurring during these periods, and we should not be justified, without closer inquiry, in arguing from them a greater disposition to hallucinations at one age than at another. For it stands to reason that fewer answers were received from persons between 60 and 80, since only the minority reach that age; and careful observation would no doubt reveal a

[1] A similar curve is shown by the Munich collection. See Table III. *b*.

much higher percentage among children.[1] In any case it seems very desirable, in view of the importance of the question, that some statistics bearing upon it should be collected and published.

Nationality.—One table of the English collection is devoted to the nationality of the informants. It yields the following results (see Appendix II., Table IV.):—

		Affirmative Answers.		
Answers from English-speaking countries	... 15,940 ...	1,499 =	9.4	per cent.
Answers from Russians ...	680 ...	108 =	15.9	„
„ „ Brazilians ...	264 ...	63 =	23.9	„
„ „ other nations ...	116 ...	14 =	12.1	„

These figures show that the percentage of affirmative answers decreases in proportion as the total number of answers increases, and indicates that the percentage already quoted, 11.96, must be regarded

[1] Children seem to be specially liable to hallucinations. As to what is the earliest age at which hallucinations may occur, an instance is given by Thore, *Ann. Méd. Psych.*, 1860, p. 168, of a hallucination seen by a child of 5 years old during convalescence from an attack of pneumonia. Berkhan, *Irresein bei Kindern* (Neuwied, 1863), reports one in the case of a little boy of 3½. Kelp, on the other hand, considers (*Irrenfreund*, 1879) that the alleged occurrence in such a case is due to a mere confusion of expression; that the occurrence of hallucinations is only possible in older children, as, for instance, in those cases of epileptic children observed by Köhler (*Irrenfreund*, 1878). In the *Annales des Sciences Psychiques*, Jan.-Feb. 1894, p. 7, an instance is recorded of hallucination in a child not quite two years old. But no one who has watched the lively dreaming of a two or three-year-old child will find anything remarkable in the occurrence of hallucinations at that age; compare Sidney Ringer, *Med. Times and Gazette*, May 1867; *Ann. Méd. Psych.*, 1848, "Un mot sur les hallucinations de la première enfance;" see also above, p. 30, Note 3. Amongst the hallucinations experienced by children grotesque or monstrous forms seem to predominate.

as still too high, and as certain on a further "intensive" (not extensive) inquiry to be further lowered. It cannot indeed well be otherwise. The collectors of the answers were themselves interested in the subject, and were very probably therefore acquainted with cases of hallucinations; and although they had been instructed carefully to avoid selecting the persons to be asked according to what they were likely to say, still it is not to be expected that they would as a rule exclude cases already known to them (which would also have been a kind of "selecting"). It would be but natural indeed that they should obtain accounts of such cases first. Thus it happens that the fewer the answers received, the higher is the percentage of 'yeses'; and the more thoroughly the field is gleaned, so to speak (the more "intensive" the inquiry), the smaller is the proportion of affirmative answers received. A similar result is given by a comparison of the English *ad interim* reports[1] with each other:—

I. Report up to 24/10/1889...	Answers,	2928...	Affirmative,	12.4
II. „ 11/7/1890...	„	6481...	„	11.1
III. „ 1/7/1891...	„	9276...	„	11.46
Congress Report, 1/7/1892...	„	17,000...	„	9.9

That is to say, that after the first 3000 answers had brought 12.4 affirmative answers, the following 3500 brought only about 10 per cent. Then the percentage rose—perhaps as the result of new sources being drawn upon—to fall still lower in the last period. Up to the middle of 1890 (II. Report), out of 6481 answers, 11.1 were affirmative; between the third *ad interim*

[1] Quoted from the *Proceedings of the S.P.R.* for the corresponding years.

Report and the Congress Report, that is to say, between July 1891 and July 1892, the answers received numbered 7724, of which only 8.8 were affirmative. But if the figures in the third intermediate Report related only to England, and the reports from Brazil, etc., were not received or incorporated till the fourth period (which seems probable from the heading of the *ad interim* report), then the difference is still more striking; for it would appear that the 6481 answers in the second Report, of which 11.1 were affirmative, must be contrasted with the total of 6664 answers in the fourth period, of which only 6.6 were affirmative.

If we leave out of account the figures of the Munich collection, which are too small to generalise from, we find that Table I. gives the same result:—

Collected by Marillier	..Answers,	3493...	Affirmative,	19	per cent.
„ W. James..	„	6311...	„	13.5	„
„ the S.P.R..	„	17,000...	„	9.9	„

For these reasons it seems to me that even the percentage of the English-speaking section, in which every eleventh individual can remember having had a hallucination, is considerably too high; nor is this inaccurate result rendered more accurate by the addition of reports from other countries (see Table I. *b*.).[1] On the contrary, an inquiry on such a superficial and extensive plan yields results which are more and more misleading, since only the cream is skimmed off. Nothing but a rigidly intensive inquiry spread over a comparatively small area can, in my opinion, lead to approximately correct results

[1] For this reason I rely in the following account only on the figures of the English collection. The results of the Munich collection are given in the Tables at the end.

—results which may be checked and amended later by the figures yielded by similar inquiries in other districts. Whether equally thorough researches in various countries and among different nationalities would show any marked difference in the frequency of hallucinations is another question. The surprising results of the French collection seem to indicate such a difference, but the material before us would not justify us in answering the question one way or the other.[1]

Health and Heredity.—According to the Report, 23 cases which took place during scarlet fever, or typhoid, or other similar states, were counted in the tables as though the persons who had experienced them had answered "No," as it was the purpose of the inquiry to enumerate the hallucinations only of

[1] The fact that in the cases in which all the members of certain well-defined groups were questioned (for instance, the guests at one table, the dwellers in one house, the members of a committee) a higher percentage than the average resulted, in nowise weakens my contention, for the number of persons in these groups was by far too small. Thus answers were obtained from 625 persons in all in such groups, of which 82, or 13.1 per cent., were affirmative—41 visual, 37 auditory, and 10 tactile hallucinations being reported, while in three cases the details were not given (collection of the S.P.R.). It is shown, on the other hand, by the English committee, that 6500—that is to say, over one-third of the total number of answers—were collected by 37 persons. These collectors, at least, must have gone pretty thoroughly through their circle of acquaintances; moreover, some of the rest of the collection was made by their friends, whose circle of acquaintance would overlap theirs, so that certain sets of people have been exhaustively canvassed. The Brazilian collection was the work of one collector, yet these figures do not seem to me to be inconsistent with the assumption of selection. That selection has taken place is acknowledged in the Report, and in the interesting cases—the "telepathic" ones—its influence is specially noticeable. In drawing up the Report it was a matter of some difficulty to trace even these obviously selected cases and to eliminate them from the calculations.

persons in a normal condition. Nevertheless, 123 other cases were retained, in which a certain degree of ill-health was reported. In 21 of them the percipient was in a state of convalescence after some illness, apparently acute, and in 55 a state of depressed health or minor illness was indicated by such expressions as "in a nervous, dyspeptic condition," or "bronchitis with weakness of the heart." In 48 per cent. of the cases no statement at all was made as to health; in about 44 per cent. a positive statement was made that the percipient was in good health at the time. The proof that this was really the case rests for the most part solely on subjective impressions.[1] In a few cases in the Munich collection, where the reports were collected by medical men, such remarks are to be found as "nervous temperament," "marked chlorotic condition," along with notes to the effect that the percipient was perfectly sound in mind, and so on.

No questions referring to the heredity of the percipient were printed in the schedules, and thus the Report has no statistics on the subject. But the question whether certain families show a predisposition to hallucinations has been treated as far as the fragmentary material would allow, with the following results:— Taking three generations of lineal descendants into consideration, it was found that in 34 families hallucinations had occurred in at least two generations; in 41 families they had been experienced by a brother and sister, or two sisters, or two brothers; and in 10 cases by at least two persons

[1] There are a few cases which should be more strictly judged, and perhaps ruled out—such cases, for instance, as 327.25, where, according to the account given, a high degree of hysteria was present.

related to one another as uncles or aunts to nephews or nieces, or as cousins, or by "other members of the family," whose exact relationship to the percipient is not stated. Nor does the material collected on the subject of the kinship of persons who experience collective hallucinations (those simultaneously shared by two or more persons) furnish us with any trustworthy data concerning family predisposition to hallucination; it proves nothing more than that such experiences are most likely to be shared by those who spend a great part of their time in each others' society.[1]

State of Consciousness.—In one important particular the sensory fallacies with which we are now dealing seem to be distinguished from all others. While in most other cases a more or less general state of dissociation of consciousness is met with, the sensory delusions are here supposed to take place in a state of complete wakefulness. According to the schedule, it is only under such circumstances that the question is to be answered in the affirmative; and the answers are mostly to the effect that the apparitions, voices, etc., occurred in the waking state.

Nevertheless, the Committee of the S.P.R. have seen fit to divide these reports into two groups, and to distinguish the cases in which the percipient was out of bed, or even out of doors, and in which, therefore, he might be presumed to be fully awake, from those cases where the hallucinations occurred in the brief interlude between two periods of sleep, or generally when the percipient was in bed. The latter class are reckoned as "borderland hallucina-

[1] With regard to the collective hallucinations, it would have been interesting to know the ages of the percipients.

tions." On a first comparison of the figures in these two groups we seem to find confirmation of the percipient's own statement, that the hallucinations occurred during the waking state, and furthermore it seems possible to establish a rule as to the conditions under which they occur.

Thus, if we take the relative figures out of the various tables and examine into the frequency of hallucinations in the following circumstances,[1] we discover a marked preponderance in the waking state as opposed to the "borderland" state.

The figures are as follows:—

Visual hallucinations	when fully awake		611	...	Borderland	394
Auditory	„	„	225	...	„	192
Tactile	„	„	79	...	„	80
	Totals .		. 915	...		666

It would seem, then, as if the rule were that the conditions favourable to the occurrence of the dream-state are unfavourable to the occurrence of hallucinations. Indeed, this rule finds further confirmation when we compare the sensory delusions occurring during a short break between two states of sleep with those which occur at other times when the percipient is in bed; for here also, in this conspicuously favourable moment for the occurrence of dream-consciousness—the short interlude between two states of sleep,—only 127 hallucinations have been observed, while more than double that number have been reported as taking place in bed, but not in this borderland state.

Such a result, however, seems to me self-contradictory. It is impossible to reconcile it with the

[1] Compare Tables V., V. *b*., VI. *b*., VII.

known fact, that in the experimental induction of hallucinations it is just this dream-state we seek to bring about by every means in our power, narcotic, psychic, or hypnogenic. We are therefore bound here also to assume dissociation of consciousness as the favourable ground in which alone sensory delusions flourish, and when it is borne in mind that we are now dealing not with the hallucinations which actually occur, but only with those which are remembered, the figures, which seem to clash with our view, serve further to confirm it, and the dissociation which we have assumed *a priori* is found to be not inconsistent with the facts. If we look at the figures in this light, it is easy to see why the conditions favourable to the occurrence of dream-consciousness impede the remembrance of the sense-deceptions experienced in that state. In the first place, these conditions promote deep sleep and the amnesia associated with it, and, secondly, even in a less profoundly hallucinated state the conditions are favourable to the transition into true sleep, in which new dreams occur, which serve to blot out the impression of those experienced in the previous state.[1] On the other hand, everything which impedes the occurrence of dream-consciousness tends to preserve the memory of the sensory delusions experienced in the light stage, and to prevent the percipient from passing into a deeper state, and thus ultimately makes for a sudden arousing of the dreamer into the state of waking consciousness, the only state in which memory of a hallucinatory experience is possible, or at least probable.

[1] Compare Moll, *Der Rapport in der Hypnose*, p. 318 (38), cases 23 and 24.

Evidence of Dissociation furnished by these Narratives.—A large number of the narratives dealt with in the Report indicate that the informants were firmly convinced that their hallucinations occurred in the waking state. In a few cases only do the percipients themselves admit, or suggest, that they may not have been fully awake, and express their doubts by saying, "I was drowsy," etc. In such cases we may safely assume the presence of a dream-state. In other accounts the narrator is not sure whether he was awake or asleep, or perhaps he points to some circumstance to prove that he was awake at the time.

In considering these cases, we must not forget the lessons of the preceding chapter. In every case we should be on the look-out for hints and suggestions indicating that the narrators are mistaken as to their state of consciousness; and, as a matter of fact, there is no lack of such indications. It is evident, for instance, that in many cases the hallucination was experienced at the moment of waking. Thus, to quote a less recent case in illustration, a clergyman reports that while he was lying in bed he heard a loud knocking, and called out "Come in," whereupon there entered a gigantic shape—the figure of his host, as we may suppose, fantastically altered and grown to huge proportions. The apparition vanished with a loud crash, and directly afterwards the owner of the house himself came into the room and asked what was the matter, he had heard such a noise. In this case the dream was evidently evoked at the moment the host knocked and entered; and some loud noise which had been heard all over the house, and had tardily

penetrated to the dreamer's consciousness, also played a part in the drama.[1]

In the same way the dreamer sometimes lives through a long and exciting romance, ending in a duel perhaps, and the noise of the pistol shot wakens him at the exact moment when the wind bangs a door. In both cases the fantastically interpreted sound is the starting-point of the dream, and in the waking recollection the complex sensory impression is split up and represented as a chain of events. *Propter hoc, ergo post hoc.*

Again, it seems to me that the frequently recurring phrase, "I had just awakened and given my baby the breast," does not necessarily imply a state of waking consciousness. I think that in such moments a more or less drowsy state may often be presumed, to which the exhaustion of a recent confinement, and perhaps also the monotonous sucking of the child and similar circumstances may contribute. Of course cases where the percipient, though not in bed, was resting after dinner on a couch or in an arm-chair belong to the same category.

Further, in some cases we find evidence of suggestion acting in a state of expectancy, especially in collective hallucinations. For instance, a wife saw an apparition; the husband declared he could see nothing, but when the wife laid her hand on his shoulder, saying, "George, do you really not see

[1] Retarded perception is illustrated by the case of a lady hypnotised by me, who at the time heard nothing of the noise made by X., one of those present. Even when I asked her, "Do you hear what X. is doing?" she said she heard nothing. After X. was quiet again and some other matter had been talked of by the subject and myself, she suddenly asked me, "Why is X. knocking over the chairs and laughing?"

him?" the apparition speedily became visible to him too. Or, again, a son waked his mother in the night by calling out, "Look, mother, there is Mr. ———," whereupon the mother also saw the figure. In another case a child saw the form of his mother, who had died recently, and screamed aloud so that his father and nurse hurried to him, and then shared in the vision. A lady saw one night the form of her sister standing by her bed: "If it is real, and not a delusion, I shall see her reflection in the mirror," she said to herself. The fact that the hallucination was reflected in the mirror, while the percipient was only half awake and in a state of excited expectancy, completely convinced her that it was a real objective figure which she saw.[1]

In other cases we have evidence that fixation of the eyes, or prolonged, abstracted gazing on a shining surface, has had some share in bringing about the phenomenon. Some narrators, indeed, state that the hallucinations occurred when the eyes were directed fixedly to one point; for instance, "as we were gazing intently at part of the dress," and so on. To this category are to be referred the apparitions seen while the percipient stands before the mirror (perhaps dreamily brushing her hair), or those phantasms which haunt a writer or reader who has had the white paper for a long time under his eyes, especially in bright lamplight. It is also to be noted that in percipients who are often subject to hallucinations, over-work or over-strain and similar causes induce numerous waking hallucinations, and that in 13.56 per cent. of the cases nervous disturb-

[1] Compare the interesting chapter on Expectancy and Suggestion in the Report, pp. 174 *et seq.*

ances, such as grief or anxiety, are reported. It should be added that in 62 per cent. of the cases of visual hallucination it is stated that the percipient was alone; that is to say that the presence of others, a circumstance which conduces to the waking state, is unfavourable to the occurrence of hallucinations.

A few more examples may serve to illustrate this point. The first case is hardly to be distinguished from a dream, called up by the perception of the morning light at the moment of waking. It is possible that the "loud scream" mentioned by the narrator was also dreamt.

(Munich Collection, x. 13.) Three years ago in the spring of 1886 (the month was April), between four and five o'clock in the morning, after I had waked, I saw my sister, who had died in her ninth year, standing by my bed. She was dressed in her grave clothes. She approached my bed. At first I could only see something dim and mist-like, out of which the figure grew as it came near. I screamed aloud, and the form, which was not yet fully developed, melted away before my eyes. A sister who slept in the same room was not wakened by my cry, and did not share my experience.

In the next account the effect of long abstracted gazing, perhaps in a state of fatigue, at a sheet of paper, seems to be clearly indicated. The vision appears to have been an illusory perception of the after-image of the brightly lighted paper.

(Munich Collection, xv. 10.) At the time referred to (according to my recollection between 1 and 2 A.M., towards the end of November 1879) I felt as though a hand touched me on the right shoulder, and turning round I seemed to see the form of my friend, Lieutenant Chr——. As the door was locked I exclaimed, fully persuaded of the reality of the figure, "How came you here, in God's name?" The apparition gazed fixedly

at me, as I at it, and vanished in a few seconds. I sprang up and examined the door, which I found locked on the inside, and I could in nowise explain the occurrence, as I believed myself to be fully awake. According to my usual habit I was studying, and absorbed in the book I was reading, but was nevertheless, as I certainly believe, fully awake. The impression came from my friend Chr——, in whose company I had been five or six days previously. I knew there was a duel before him, but nothing more. At the moment when I had the hallucination my friend was no longer living, although I was ignorant of the fact. On the morning of the previous day he had been wounded in a duel, and died a few hours later, before noon. I first heard of his death on the morning after I had seen the apparition, at half-past seven o'clock. In a talk we had had together—Chr——, another friend, F., and myself—about three or four weeks before, we promised each other (on our oath) that if there was a life after death the first to die would give the others a sign, to assure them of the fact of an existence beyond the grave. The third, F., has died since, but without giving me any sign, and he on his part had received no sign from Chr——. As regards the details of the apparition, my friend appeared to me in full uniform, and just as I knew him in life, even to his pleasant expression, though the gaze was fixed. He stood perfectly still for a moment before me, and then vanished. Although the lamp was covered with a dark green metal shade, and the upper part of the room was therefore but dimly lighted,[1] the figure seemed to me unnaturally distinct, as though it were lighted up from some other source.[2]

(S.P.R. Collection, 579. 24.) "C'était à Milan, le 10 (22) Octobre, 1888. Je demeurais à l'hôtel Ancora. Après le dîner, vers 7 heures, j'étais assis sur le sofa et je lisais une gazette. Ma femme se reposait dans la même chambre sur une couchette, derrière un rideau. La chambre était éclairée par une lampe placée sur la table, auprès de laquelle j'étais assis et lisais. Tout-à-coup je vis sur le fond de la porte, qui se trouvait en face

[1] While the book on which the percipient, Dr. H. Gr——, was gazing was, of course, intensely lighted up.

[2] Compare the account in Brierre de Boismont (*Des hallucinations*, pp. 391 *et seq.*) of the apparition of Ficinus, to which the above case bears a very close resemblance.

de moi, la figure de mon père ; il était, comme toujours, en surtout noir, très pale, comme mourant."

(S.P.R. Collection, 83. 21.) "I sat one evening reading, when, on looking up from my book, I distinctly saw a school friend of mine, to whom I was very much attached, standing near the door. I was about to exclaim at the strangeness of her visit, when, to my horror, there were no signs of any one in the room but my mother. I related what I had seen to her, knowing she could not have seen, as she was sitting with her back towards the door, nor did she hear anything unusual, and was greatly amused at my scare, suggesting I had read too much or been dreaming."

The following case may perhaps also be explained in the same way:—

(Munich Collection, xv. 2.) "I remember distinctly—I must have been thirty-seven years old at the time, and was still in the Service—that I was sitting at my writing-table when I seemed to hear a voice calling out some words to me. On getting up and looking about for the servant I found the whole house empty, nor was there any one on the street (five in the afternoon). When I tried to think whose the voice resembled, I found that it had sounded distinctly like that of my deceased grandmother (on the mother's side). The words that she had uttered chimed in with my thoughts, and that was what had so surprised me when I heard them."

If it be objected that we are assuming too much, and exaggerating the hypnogenic tendency of prolonged reading, I may point to the fact that it is at least a matter of common knowledge, and that reading is a means popularly employed to induce sleep, whether as a prelude to the afternoon nap or by candle-light in bed. Thus the mother of the percipient, in the case mentioned above (*S.P.R.* Collection, 83. 21), attributed her daughter's strange experience to the fact that she "had read too much, or been dreaming." An explanation of the way in which

fixed attention brings about dissociation, or, in terms of physiology, the splitting off of the neural elements, will be found in Chapter V.

It has been already observed that fixation of the eyes associated with automatic movements is liable to produce dissociation. In the following cases the strain of working at sewing seems to have acted in the same way as gazing on a mirror, and to have produced a short twilight of consciousness.

(Munich Collection, xxiii.) On the 15th of March, 1878, at ten o'clock at night, I saw an apparition of myself. One of the children was sleeping restlessly, I took the lamp to see if anything was wrong. As I drew back the curtain which shut off the bedroom, I saw two paces from me the image of myself stooping over the end of the bed, in a dress which I had not been wearing for some time: the figure was turned three-quarters away from me, the attitude expressed deep grief. . . . I was neither specially sad nor specially excited that evening, and had been thinking about quite ordinary things. I was alone: a friend who had been with me had left about half-an-hour before, and I had been working at the sewing-machine. I was quite calm, in good health,[1] and thirty-nine years old. Three months before I had lost one of my children. It has just occurred to me while writing this, that after death my child was laid across the foot of my bed, and I may have stood in that attitude then. The dress, too, was the one I was wearing at the time.[2]

In a few cases the informants state that they fainted from terror or shock at the apparition. Such

[1] Nevertheless the same informant adds:—"I belong to a very healthy family, and was never ill up to my twenty-second year. Now I suffer from extreme nervousness, which may indeed have been present even in 1878, though it had not yet appeared as a definite ailment."

[2] Compare, among other cases in the S.P.R. Collection, No. 730. 24, and perhaps 442. 17. See Report, *Proceedings S.P.R.*, August, 1894, pp. 233 and 213.

communications remind us so forcibly of the hallucinations of the epileptic and hystero-epileptic aura, that we can hardly resist the conclusion that they occurred in a semi-conscious state, possibly of very short duration, preceding a state of complete unconsciousness.[1]

The private opinion of the percipient of the lapse of time between the appearance of the hallucination and the loss of consciousness is absolutely irrelevant, since in such severe disturbances of consciousness gross errors in reckoning time are constantly made. The following accounts may be taken as typical.

(Munich Collection, iv.) When my father died I was in Posen (Czernik bei Posen), and was three years old. I did not know him, and did not see him lying dead in his coffin. Thirteen years later, when I was sixteen, I went out of my paternal house in the snow. I cannot exactly fix the date—perhaps it was Christmas Eve—at eleven o'clock. Suddenly my father stood before me, in a black coat with shining buttons. The coat was a long one, reaching to the feet. He seemed taller than life, and wore a black cap. I tried to seize hold of him, and received a kind of electric shock. The dogs would not bark, and crept about my feet, whining with their tails between their legs. I fell down in a faint. Several minutes had passed between the dogs showing signs of excitement and my fainting. . . . There had previously

[1] Of the six cases of this kind given in the Report, there are three in which it is pretty clear that the loss of consciousness was not the "organic effect" but the cause of the hallucination. Thus one percipient in Australia, almost suffocated by the fumes of charcoal in his tent, on going outside to escape them saw a vision of his mother and then lost consciousness; a second saw an apparition of his father, fainted, and reports that "a severe nervous illness dated from that evening"; and in a third case a state of nervous agitation is clearly indicated. Case 728. 16 (p. 309), points to a similar explanation, if we consider the striking amnesia of the lady, clearly the principal percipient. Her *fiancé's* hallucination would appear to be the secondary one, caused by the words which she screamed and the shock of seeing her faint away.

been three taps on the window when we were speaking of my father. I alone heard the knocks and went out because of them. I opened the door, the whining dogs pressed close about me; I started and fell down. I did not recognise my father, but I described him, and my conjecture was confirmed. The dogs refused to be driven out again.

(Munich Collection, xxxix. b.) On New Year's Eve, 1885-86, in consequence of something I had read, at exactly twelve o'clock I took two lighted candles, one in each hand, and alone, fully awake, feeling rather sceptical and not at all excited,[1]

[1] That the percipient was "not at all excited" is extremely unlikely, if only for the reason that not six months before, on the occasion of her father's death, she had experienced a "veridical" hallucination, of which, at least, she seems to have spoken pretty often with her family, for she adds in her narrative, "My relatives never experienced anything of the kind. . . . My mother assures me that a clock stopped exactly at the moment when death occurred." Besides, in the communication relating to this hallucination the false reckoning of time at least indicates a state of dream-consciousness. She writes (Munich Collection, xxxix. a):—"At the time when my father was very seriously ill, and was lying in a room on the ground-floor, I went upstairs to my room on the second floor to bed one evening (8th July, 1885), at about nine o'clock, accompanied by the nurse. The latter left the room with the request that I would lie still. She had hardly left the room when I had a feeling as though the bed-clothes were being pulled off. This happened twice. I was wide awake, and suddenly saw my father sitting in his wheeled chair, as he generally did, in a room, but apparently some distance off. I closed my eyes from fright, and the picture vanished. I lay awake much disturbed, and connected this experience with my father's illness. After a short time, about a quarter of an hour, I opened my eyes. Suddenly I saw a white mist like a shadow pass before them. I screamed aloud, sprang out of bed, and, scantily clad as I was, hurried anxiously downstairs, to see how my father was. At the foot of the stairs the Sister of Mercy met me, and told me he had just passed away. My father was eighty-one, and much enfeebled by age; he had been lying seriously ill for some time, and had been wandering in his mind for eight days. Suddenly, to the Sister's astonishment, he called out my name in a clear strong voice. This was ten minutes before his death, just at the time I had the vision." Let the reader try to imagine the state of mind of any one keeping the eyes shut for ten to fifteen minutes in a state of anxiety and terror, and he will know what to think of the "short time."

having first locked the doors of my room, I went and stood in front of the looking-glass. Suddenly I saw in the mirror the form of a tall, haggard-looking man, who approached me with audible footsteps. I fell down in a faint, and was ill for several days. When I came out of the faint the lights had gone out.

Further, through their common dependence on external stimuli, the content of waking hallucinations often bears a resemblance to that of dreams. Thus the following account, 417. 17 (Report, pp. 202 *et seq.*), recalls the dream of a dental operation quoted above:—

Vers 5 heures du matin j'ai vu l'apparition suivante:—Éveillé aprés un sommeil sans rêves, j'éprouvais une terreur panique et une stupeur complète sans pouvoir bouger, ni proférer une parole. . . . Il prit de sa main droite ma main gauche, et y enfonçant ses ongles, ce qui me causa une douleur aiguë, dit à voix basse. . . . Je ne me suis plus endormi et pendant plusieurs jours après cette apparition j'éprouvais [this is the main point] des douleurs neuralgiques et des contractions dans ma main gauche. . . . Des apparitions semblables, mais moins distinctes me sont déjà arrivées plusieurs fois . . . 1880, 1884, 1886, et 1889. Dans tous ces cas les apparitions n'étaient précédées d'aucune maladie, mais elles amenaient à leur suite des indispositions physiques plus ou moins marquées. Je ne puis pas dire que l'état de conscience dans lequel je les ai éprouvées fut tout-à-fait normal.

And the other cases given in the Report, pp. 203-205, also show this resemblance, while those accounts in which the illusory interpretations of noises, tactile impressions, etc., seem to make up the content of the hallucinations, remind us forcibly of "nerve-stimulus dreams." Such an analogy is of course no proof, but taken in connection with all the other traces and indications, it serves to help us to a comprehension of the hallucinatory state of consciousness.

Why it is not always possible to prove Dissociation.

—Although in these and similar ways a disturbance of consciousness more or less profound is indicated by the accompanying circumstances in a great number of these cases, there remain many narratives in which there are no direct indications of the kind, and such disturbance can only be assumed by a certain straining of the facts. Must we then suppose, all considerations to the contrary notwithstanding, that in these cases the assurance of the percipient that he was fully awake at the time is not based on self-deception? Are we, that is, to judge these narratives by a different standard from those others in which, as we have already seen, similar assurances, given with the same firm conviction on the part of the narrator, proved to be mistaken?

In this connection it is important to remember that the narratives are in many cases very meagre, and are occupied mainly with the content of the hallucinations rather than with the state of consciousness which accompanied them. Less attention was paid to this latter circumstance, both in the questions put and in subsequent tabulation of the answers. Experiences known to be dreams were excluded from the first by the form of the main question; and if the experience could really be counted as a "waking hallucination" the attention was naturally directed mainly to its form and content, and to such points as the exclusion of errors (*e.g.*, the mistaking of real objects and persons, illusions), the corroboration of other witnesses, the coincidence of the experiences with other events (death or illness), and such-like. These considerations sufficiently explain the want of evidence for a state of dissociation. When we come to consider the series of twenty-seven coincidental cases, which are nearly

all fully described and carefully examined, we shall find that all but seven narratives contain unmistakable indications of the presence of a state of dream-consciousness.

The difficulty of distinguishing the hallucinatory experience from the facts of real life must also be taken into account. Hallucinations tend to take their place in the memory alongside of real events, and to become indistinguishably merged with them. This is illustrated by Bernheim's[1] well-known experiment; a subject was given a waking suggestion that a certain fictitious narrative had been told him by a fellow-patient; whereupon this delusion became associated with a genuine experience, and the subject maintained in proof of what he said that he had heard the story when his room-mate came back from the town the evening before bringing him an Easter-egg.

Thirdly, the accompanying circumstances tend to fade, and the memory remains preoccupied with the more absorbing interest of the astonishing phenomenon itself. If it is often difficult after a short lapse of time to remember the accompanying circumstances, even in matters of ordinary perception, and where the attention was fully alert,[2] how much more after several years have passed? Now, of the seven accounts already referred to, which make no mention of circumstances indicating a state of dream-consciousness, six refer to occurrences which had happened more than nine years previously, and the experience is of such a kind that the picture preserved in the memory has been constantly modified and touched up, so as to differ widely

[1] Bernheim, *De la Suggestion* (2nd edit.), chap. ix.

[2] Compare Hodgson, "The Possibilities of Mal-observation and Lapse of Memory," *Proceed. S.P.R.*, 1886-87, pp. 381 *et seq.*

from the actual facts, if indeed it were ever a faithful representation of facts. Thus frequently, as in the case of the clergyman (p. 93), the account of the hallucination is misleading, because the time-relations are incorrectly remembered, and events which were really simultaneous become successive in the memory.

To illustrate this by an example: Suppose the hallucination to have been only a visual one, for instance, the figure of a woman clad in white standing in front of me to the right. Her position suggests that I have seen her glide past me from left to right, and then the impression that I must have seen her first on the left will appear to have been preceded by the sound of a woman's voice, causing me to turn my head in that direction. The hallucination is in reality a visual perception—a-white-figure-coming-from-the left-first-seen-there-by-me-on-hearing-a-sound. In the memory, however, this "complex" is split up into elements which are localised separately in time, and becomes changed into something like the following:—"I was standing alone in the room when I heard my name called from the left. It was a woman's voice, and I turned round in surprise. What was my astonishment when I saw"—and so on. The account of the apparition of Lieutenant Chr——, after he had been killed in a duel, was probably a case of this kind, where the preliminary tactile hallucination at least seems likely to have been an illusion of memory.

How widely this kind of memory illusion operates it is of course difficult to say; in my opinion far too little allowance is made for it. This is borne out by observations made by careful witnesses. A dream is

soon forgotten unless it be mentally recapitulated and noted, or told to some one. If this is done the dream may indeed be remembered and told for years, but still careful self-observation reveals that it is not so much the dream images as the memory images fixed immediately after waking which are recalled.

In studying these narratives we must bear all this in mind, and we must remember further that the narrators are not always of a critical turn of mind.

The frequent recital of an interesting occurrence tends to imprint a distinct picture of it on the mind, and the vividness of the mental image serves further to confirm the percipient's conviction of having been fully awake at the time—a delusion common with persons in a drowsy, half-asleep condition. It is not, then, much to be wondered at if gradually all subsidiary detail fades away, until finally there remain in the memory only two points of cardinal importance—the hallucination itself, and the conviction of having been fully awake. For my part, I am inclined to wonder less at the rarity of suspicious circumstances in a series of such accounts, than that, all adverse influences notwithstanding, so many and such clear indications of dissociation of consciousness still remain.

Even the cases which do not directly support my view may, by the following analysis, as I still hope to show, be brought into harmony with it.[1] For in general, the more recent the case, the less improbable does it appear from the narrative itself that the phenomena recorded were not hallucinations, but either illusions or objective sensory perceptions mistakenly supposed to be subjective.

[1] Compare Report, p. 66.

Realistic Apparitions of Living Persons.

Within the last three months . .	35	Doubtful cases,	8
„ previous nine months .		„ „	6 = 14
Over one year, but not over five years	62	„ „	13
„ five years „ „ ten „	60	„ „	8

The Report explains this falling-off by assuming that the "doubtful" cases make less impression and are soon forgotten; but I see no grounds for such an assumption, since the percipients in these cases, no less than in the others, were convinced of the genuineness of their experiences. To me it seems the truer explanation that in the more recent cases the accounts are more detailed; in the older ones all accompanying circumstances which might throw doubt on the genuineness of the hallucination have disappeared,[1] such as, *e.g.*, the state of the light and the physical surroundings, or any indications of a state of dream-consciousness on the part of the percipient.

Hallucinations classified according to the sense affected.—In passing on to another point, we must consider the share of various senses in the hallucinations. According to Table II. *d.* they are reckoned as follows:—

Hallucinations of a single sense		1890
Visual	1114	
Auditory	629	
Tactile	147	
Hallucinations simultaneously affecting several senses		271
Visual and auditory . .	181	
Visual and tactile . . .	38	
Visual and olfactory . .	1	
Auditory and tactile . .	21	
Visual, auditory, and tactile .	29	
All four senses . . .	1	

[1] Note in this connection that of the 12 cases of visual hallucinations, none more than a fortnight old, given on p. 7 of the Report, 7 are regarded as doubtful.

The Less Startling Hallucinations are soon forgotten. —These figures seem to me, however, to show not so much that our hallucinations visit us most in visual pictorial form, but rather that the less striking sensory perceptions are easily overlooked, or if recognised as delusions, are soon forgotten; while the remarkable and striking ones, and especially the visual phantasms, remain longer in the memory. This view is supported also by the fact that among rudimentary hallucinations (not fully developed, lights, vague objects, and sounds) the visual preponderate, simply because the great mass of obscure and partially projected hallucinations of the other senses fade from the memory sooner and more completely. This is shown still more clearly by a comparison of the hallucinations reported as occurring within the last ten years with those remembered from the time previous to that period. (Tables V. *a*, VI. *a*, VII.)

Visual hallucinations within the last ten years .	458
„ „ of more than ten years ago.	486
Auditory hallucinations within the last ten years.	247
„ „ more than ten years ago (rather more than half)	137
Tactile hallucinations within the last ten years .	97
„ „ more than ten years ago (less than half)	41

We find further confirmation of this view in the fact, arrived at from the figures given in the Report, that the hallucinations recorded for the last year amounted, in the case of the visual experiences, to 18.9 per cent. of the whole number recorded for the last ten years, and in the case of tactile and auditory hallucinations respectively to 21.9 and 29.1 per cent. We find the same characteristic in the auditory hallucinations recorded in Table VI. *a*.

Of the less striking cases, in which the narrator heard only his name called, or only indistinct voices, 148 are reported as occurring within the last ten years, and only 53 within the previous period. On the other hand, almost as many of the more striking auditory hallucinations, in which other words or sentences were heard, are recorded as occurring in the earlier period, as the 69 in the last ten years. Again, when the voice was recognised as that of a living or of a dead person, the relative numbers (164 new cases to 97 old) indicate that the experience is more readily remembered than when the voice was not recognised (83 : 40).

Since, as we shall see later, there are good grounds for supposing that simple, non-complicated hallucinations are more frequent than those which are fully developed and distinctly projected, but that, as is natural, and as the tables show, they are scarcely noted and soon slip from the memory, we may conclude that "waking hallucinations" in sane persons are much more frequent phenomena than appears from the tables. Even should the percentage of affirmative answers on a more searching analysis be further lowered, still it is to be noted that the result refers only to the *remembered* experiences. It would be ridiculous to reckon the number of dreams by the number remembered,[1] but it would be scarcely less misleading to apply the same method of calculation to waking hallucinations.

[1] Let the reader try to remember his dreams of more than a year ago. Unless exceptionally well practised in calling to mind such experiences he will hardly be in a position to remember any great number of them clearly.

CHAPTER IV.

THE PHYSIOLOGICAL PROCESS IN FALLACIOUS PERCEPTION.

Early Attempts at Explanation—The Centrifugal Psychic Theories — Objections — The Centrifugal Sensorial Theories—The Conception underlying all Centrifugal Theories—Arguments against this Conception—Centripetal Theories—Identity of the Sensory and Ideational Centres—Theories of Pelman and Kandinsky—False Perception a Phenomenon conditioned by disturbed Association—Meynert—James—Explanation suggested by the Author—Its Advantages—Schematic Presentation of the Physiological Process in False Perception—Various Objections met.

THE first attempts to explain the physiological process in false perception were very vague and general. It was clear that to account for the more complex hallucinations—*i.e.*, those affecting several senses—the morbid condition was to be sought outside the sense organs. No doubt Joh. Müller's[1] doctrine of the specific energies of the nerves made it possible to explain how subjective sensory perceptions might appear as objective, and when it was once assumed that subjective sensations were the result of inadequate stimuli, the same explanation readily suggested itself in the case of hallucination; but it was urged against this view that while rudi-

[1] Joh. Müller, *Ueber phantast. Gesichtserscheinungen*, 1826; *Zur vergleich. Physiol. des Gesichtssinns*, 1836. For a short abstract see Schüle, *Handbuch d. Geisteskrankheiten*, 1878, pp. 136 *et seq.*

mentary phenomena, such as sparks, flashes, colours, singing in the ears, etc., may originate in this way, inadequate stimuli can never result in "complex images, arranged in orderly perspective," or words, though these play so great a part in hallucinations. If, for instance, in the subjective dream-image of a tree only a corresponding subjective excitation of the sensory nerve were necessary, then, as Neumann[1] has pointed out, a portion of the optic fibres would have to be stimulated in such a way that their arrangement should exactly correspond to the image of a tree, or to the image of the space not occupied by the tree (a light tree on a dark, a dark tree on a light ground). If we consider the great number of possible combinations, among the myriad fibres spread over the retinal surface (100 primitive fibres to the square line), such a result seems highly problematical. In the same way the formation of an articulate word would be barely probable, that of a sentence practically impossible.[2]

Hence the search in this direction was soon abandoned. The older writers indeed confine themselves for the most part to vague generalities,[3] with

[1] Neumann, *Lehrbuch der Psychiatrie*, § 142, 143.

[2] Leubuscher, *Ueber die Entstehung der Sinnestäuschungen*, 1852, p. 29. Compare Griesinger, *op. cit.*, pp. 87 *et seq.*

[3] Thus Bottex, *op. cit.*, p. 12, believes that hallucinations, like dreams, are the result of an irritation of several parts of the brain, now of one and now of another, which are momentarily not under the control of the will. J. B. Friedrich, "Einige Worte über den psycholog. Werth der Sinnestäuschungen," *Fr. Arch. f. Physiol.*, 1834, vol. ii., maintains that hallucinations depend on an abnormal state of the sensorium which arrests the freedom of the will and the power of judgment. Brierre de Boismont, *op. cit.*, chap. 17, points out reasons which tell *a priori* against the dependence of fallacious perception on specific anatomical disturbances, and quotes Lélut, Calmeil, and Leuret in support of his view.

two distinguished exceptions, Erasmus Darwin and Foville, who attribute a semi-sensorial character to the morbid affection, which they locate partly within and partly outside the sense organs, and express the view that not only the nerve tract between the organ and the brain is affected, but that the more complicated hallucinations of several senses can be explained only by assuming the implication of those brain-centres at least in which the sensory nerves originate. Macario distinguishes various kinds of hallucinations and assigns them various sites.[1]

Although, as time went on, attention was directed more and more to this problem, no explanation has yet been offered which has met with general acceptance, as the numerous attempts at a theory of hallucination sufficiently testify. In considering the most important of these attempts, in discussing the various views advanced and the arguments used to support them, we shall make ourselves acquainted with the leading facts, and thus be in a position to form an independent judgment.

Two main points had to be considered in the elucidation of the problem: on the one hand the sensory character of the phenomenon, on the other the great part played by temperament, mental and

[1] Macario, in the *Ann. Méd. psych.*, Nov. 1845, Jan. 1846, distinguishes hallucinations as follows: firstly, external or *sensorial* hallucinations, which originate in the sensory nerve; secondly, those which are *ganglionic*, resulting from lesions of the great sympathetic nerve (*e.g.*, frequently in hypochondriacs); thirdly, those which are *intuitive*, or caused by "inner" vision (for instance, in ecstasy and hysteria); and lastly, *sthenic* hallucinations which arise from heightened sensibility, and should be regarded as a neurosis of the sensory nerves (*e.g.*, the visual hallucinations of watchmakers, auditory hallucinations in the case of cooks who spend a great part of their lives in hot kitchens).

emotional bias, education, superstition, the spirit of the times, etc., in determining what the hallucinatory object should be, and investing it with form and colour. Supposing the ideational centres to be locally separated from the sensory centres, it was natural to ascribe the imaginative factor in fallacious perception to the higher elements of the cerebral cortex, and to relegate the sensory part to those cells where, in popular parlance, incoming "impressions are transformed into sensations." As to the locality and extent of these centres, and indeed of most others, there is a conflict of views.[1] However, the first question to answer was not where are these centres situated, but what is it which, in hallucination, where no normal stimulus is present, starts in these centres the process of which we become conscious as a sense-perception.

Centrifugal Psychic Theories.—Many writers ascribed, and many still ascribe, the initial impulse to the ideational centres. On this view, either the activity of these centres must be increased beyond the normal to admit of their giving rise to an effective stimulus, or we must postulate a higher degree of irritability for the "inner sensory areas," which would lend exceptional effectiveness to ideational stimuli in ordinary circumstances inadequate.

The chief justification for this view is the fact that sensory hallucinations occur even when the sensorium (assumed to be sub-cortical) is wholly destroyed. Again, the accounts of voluntarily-induced

[1] Luys, Fournier, and Ritti believe the process to occur chiefly in the optic thalami; Schröder van der Kolk, Meynert, and Kandinsky would place the centres lower down—that of vision, for instance, in the corpora quadrigemina; Hitzig, Ferrier, Munk, and others locate them in the cortex itself.

hallucinations,[1] the fact that many patients are conscious of their imagination being the source of their sensory delusions, the decrease of hallucinations during increasing mental weakness, and their almost entire absence in cases of idiocy, seem to point in the same direction. Further, the influence of memory and experience in determining the character of the sensory delusions is cited in support of this view, and also the fact that the sense of hearing is specially liable to hallucinations—the sense, that is, which plays a more important part than any other in our psychical life, since we think in words and express our thoughts in words.[2]

In a certain sense we may even reckon Joh. Müller[3] among the exponents of this theory, since he assumed the existence in the brain of an organ for the production of imaginary images (the "Phantasticon"), and believed it to control the innermost springs of vision. So also Möller,[4] who considers hallucinations to result from the elaboration in the mind of a single more or less persistent recollection, which afterwards

[1] Compare Goethe's power to call up the hallucination of an unfolding flower. Brierre de Boismont, *op. cit.*, mentions the case of an artist who after one sitting was able to go on painting the portrait of his sitter by the aid of the hallucinatory image which he could call up at will. Griesinger cites the case of an insane person who heard voices, and who found that he could put any words he liked into the mouth of the imaginary beings who conversed with him (Holland, *Chapter on Mental Physiol.*, p. 52); and Sandras, *Ann. Méd. psych.* (1855), p. 542, records his own hallucinations, which rendered his thoughts audible to him and answered his questions, but always according to his wishes. For further examples see below.

[2] Von Krafft-Ebing, *Die Sinnesdelirien* (Erlangen, 1864).

[3] Joh. Müller, *Phantast. Gesichtserscheinungen*, § 138.

[4] Möller, *Anthropol. Beiträge zur Erfahrung der psych. Krankheiten* (1837), pp. 507 *et seq.*

penetrates into the organs of sight and hearing; and Falret, who speaks of a "lésion de l'imagination."[1] Griesinger is led to the conclusion that it is ideas which initiate and guide the sensory activities, mainly because certain individuals can voluntarily call up hallucinations, because, that is to say, vivid mental images deliberately conjured up and dwelt upon are often recognised as the exciting cause of sensory delusions.

Griesinger's deduction is shortly as follows[2]:—

As in normal sensory activity the effect produced by real external stimuli on the nervous system is, in so-called "eccentric phenomena," referred back to the part of the periphery usually excited, so a similar projection is manifested by ideas which owe their origin only to sensations. In this latter case, however, the process does not extend to the nervous surface and thence outwards, but only to the region of the exciting cause—*i.e.*, the sensorium.[3] It is apparently on this eccentric projection of ideas that their constant reinforcement by sensory images depends, and to the same cause is doubtless also due that faint subsidiary hallucination in the central sense organ which accompanies all thought, to which indeed thought owes its clearness and colour, those stores of sensory imagery in which we all to some extent share. It supplies the foundation for all those psychical phenomena which are assigned to the imagination, so that all imaginative processes may be said to

[1] Falret, *op. cit.*, "En parlant des lésions de l'imagination nous ne voulons dire qu'une chose, à savoir: que l'hallucination se rattache à une modification cérébrale analogue à celle qui dans l'état normal accompagne l'action de l'imagination." Hallucination, he adds, is distinguished from other morbid activities of the brain, which also have their analogies in normal experience, by the want of control which invariably appears when the imagination is abnormally active, and further by the involuntary nature of the phenomena and the sudden, disconnected manner of their appearing.

[2] Griesinger, *op. cit.*, pp. 29 and 91.

[3] Kahlbaum, "Die Sinnesdelirien," *Allg. Zeitschr. f. Psych.*, xxiii., describes this process as "Reperception."

consist merely in more or less lively reverberations in the sensorium. Hallucination differs only in degree from this normal activity of the imagination. In the former process, the intensity with which the projected ideas act on the sensory centre causes something to take place there which normally occurs only as a result of external excitation—viz., an act of sensation.[1]

Following Griesinger's theory, Von Krafft-Ebing[2] writes: "Hallucination is the result of an excitation of the central apparatus of a sensory nerve by an adequate ideational stimulus sufficient to give the force of a sense-impression to the answering excitation which is projected outwards." Hoffmann[3] says:—"Representative images occasionally manifest themselves so energetically that they may even penetrate into the perceptive sphere and arouse it to activity. When a representative image in the brain acts upon the central filaments of the sensory nerves it is eccentrically projected, and results in a hallucination."

Kahlbaum[4] belongs also to this school, for besides extra-cerebral phenomena depending on processes in the periphery and the sense-nerves (*Phænacismen*), and perception-hallucinations which occur either as stable, as erethic, or as functional phenomena, and are produced, according to him, in the affected ganglia either through extensive changes (disturbances of circulation, for instance) involving chronic stimulation,

[1] Compare the statement of this view by Gurney and Myers, "A Theory of Apparitions," *Proceedings of the S.P.R.*, vol. ii., 1883-84, pp. 168, 169.

[2] Krafft-Ebing, *op. cit.*, p. 11; compare p. 8; also *Lehrbuch* (1879), i. p. 92.

[3] Hoffmann, *Die Physiol. der Sinneshallucination*, pp. 19 and 23.

[4] Kahlbaum, *op. cit.*

or through minor changes which become effective only because of the functional activity of the images (*Phantomien*)—in addition to all these kinds of hallucinations he considers that there are others due to a rise of centrifugal sensory activity (*Phantasmien*). With those he would class fallacies of one sense originated by a normal effect produced in another sense, as, for instance, when an insane person thinks he is being "stitched in" or "embroidered in" when he sees people sewing, or on catching sight of a long pole feels himself being drawn out lengthwise.[1] In explanation, Kahlbaum assumes an increase of centrifugal irritability in a particular sense which is aroused into activity through the general excitation of the consciousness resulting from the first centripetal perceptional process (on the analogy of reflex movements he calls these reflex hallucinations). Lastly, he adds another class, viz., hallucinations of memory (*Phantorhemien*).

Next, Kraepelin[2] distinguishes (*a*) elementary sense deceptions peripherally conditioned, (*b*) perception phantasms which originate through inadequate stimuli (changes in the circulation, poisons, etc.) in the centres of perception (hypnagogic hallucinations in

[1] Most cases of this kind are indeed rather to be regarded as reflex insane ideas. The following case of Janet's ("L'anesthésie Hystérique" in the *Arch. de Neurologie*, 1892, No. 69) is, however, a genuine reflex or "apperception" hallucination. "When I show you the colour blue you will hear bells ringing," Professor Janet said to Isabella, a hysterical subject blind on the left side. Then when her right eye (the normal one) had been blindfolded, various coloured wools were held before her left eye. At first she said everything was dark; but as soon as a piece of blue wool was held up she cried, "Oh, I hear bells." Many hypnotic and post-hypnotic hallucinations *à échéance* might be referred to this class.

[2] Kraepelin, *Psychiatrie*, pp. 70-85.

the sane, and in the insane fixed monotonous hallucinations, generally independent of the train of thought; Kahlbaum's "stable" hallucinations); lastly (*c*), memory images of special vividness. He explains these "apperception" hallucinations much as Griesinger explains them, and groups with them Baillarger's "psychical" hallucinations, the "pseudo-hallucinations" of Hagen, and also the hallucinatory reverberation called "double thinking." For it is easy to explain such a continuous procession of sensory fallacies following the train of thought step by step, on the assumption of reperception, and of a heightened irritability of the inner sensory tracts. Alongside "apperception hallucinations" he places "apperception illusions" (in the sane the illusions caused by strong emotion, expectation, etc.; and in the insane, besides these, reflex hallucinations).

One of the principal exponents of this view is H. Taine,[1] who explains hallucinations as arising when the inner images are deprived of their usual "reductives" (*signes réducteurs*), and thus appear as sensible realities. I quote the following from his brilliant exposition of the theory:—

"In ordinary cases a disturbance of the nerves produces this action, but if it is otherwise produced it will arise without the intervention of the nerves, and we shall have a true sensation, that of a green table, or of the sound of a violin, without any table or violin having acted on our eyes or ears. Thus setting aside the medium of the nerves, we find two cases in which the centres of sensation act. First, having been set in action by the nerve, they may persist in this action spontaneously, and repeat it of themselves after the nerve has ceased to act. This is notably the case with illusions following on the prolonged use of the microscope, when the micrographist resting his eyes

[1] Taine, *De L'Intelligence*, vol. i., book ii., chap. i.

on his table or paper sees about a foot off small grey figures which persist, vanish, and reappear, continually growing paler and feebler. Secondly, the centres of sensation may act through a reflected shock, when pure mental images arouse their activity. Usually it is the sensation which provokes the image, and the transmitted action of the sensorium which is repeated in the cerebral lobes or hemispheres: here, on the contrary, the image excites the sensation repeated in the centres of sensation. This is probably the case in hypnagogic and psycho-sensorial hallucinations.[1]

"If I may be permitted a homely metaphor, let us call the conducting nerve a bell-rope, attached to a large bell, the centre of sensation; when the rope is pulled the bell rings; here we have a sensation. This bell, thanks to an imperfectly understood mechanism, communicates by various threads, the fibres of the optic thalami and the corpora striata, with a system of little bells, which make up the hemispheres, and whose mutually excitable tinklings exactly repeat its sounds with their pitch and tone. These tinklings are images. When the bell rings it sets the tinklings a-going, and when its ringing is over the tinklings continue, growing weaker and dying away, but may increase in volume and regain all their first energy when a favourable circumstance permits the persisting sound of one or two of the little bells to cause all the others to vibrate in unison. . . .

"In hallucinations of the microscope the large bell has been so powerfully and constantly set vibrating in one direction that its mechanism continues to act even when the cord is hanging motionless. In dreams and hypnagogic hallucinations the cord is relaxed; it no longer acts, the constant demands of the waking hours has used up its power of responding; external objects pull in vain, they no longer cause the bells to ring. But, on the other hand, the little bells, whose appeals have been repressed while we were awake, and whose pullings have been annulled by the more energetic pulling of the bell-rope, regain all their power, ring louder and pull more effectually. Their

[1] By "psycho-sensorial" hallucinations Baillarger means false perceptions with a pronounced sensory character, while he designates as "psychical" the so-called *soundless* voices, for instance. Binet has suggested for the first group the apter term, *cerebro-sensorial.*

movements excite corresponding vibrations in the large bell. Thus the life of man is divided into two portions—the waking state, in which the large bell responds to the cord, and sleep, wherein it responds to the little bells. In morbid hallucinations the bell-rope still acts, but its effort is overcome by the greater power of the little bells; and various causes, a flow of blood, inflammation of the brain, haschisch—all circumstances indeed which render the hemispheres more active—tend to produce these phenomena. The appeals of the little bells, which in the normal state are more feeble than those of the cord, have become stronger, and the ordinary equilibrium is upset, because one of the functions has assumed an ascendency to which it is not entitled."

Among other authors who express themselves to the same effect are Esquirol,[1] Brierre de Boismont,[2] Neumann,[3] Reil,[4] E. Pohl,[5] R. Leubuscher,[6] Schroeder van der Kolk,[7] Schaller,[8] Emminghaus,[9] L. Meyer,[10] Wijsman,[11] Friedmann,[12] and many others. As their presentations of the theory agree for the most part with those already quoted, and differ mainly in the arrangement of the evidence, and in the different localities which they assign to the ideational centres,

[1] Esquirol, *op. cit.*

[2] Brierre de Boismont, *Des hallucinations.*

[3] Neumann, *Lehrbuch der Psychiatrie*, § 201 *et seq.*

[4] Reil, *Rhapsodien.*

[5] Pohl, *Die Melancholie nach dem neuesten Standpunkt der Physiologie.*

[6] Leubuscher, *Ueber die Entstehung der Sinnestäuschungen.*

[7] Schroeder van der Kolk, *Pathologie und Therapie der Geisteskrankheiten* (1863).

[8] Schaller, *Die Hallucination* (1867; Diss.).

[9] Emminghaus, *Allg. Psychopathologie.*

[10] L. Meyer (Hamburg), *Ueber den Charakter der Hallucination bei Geisteskranken.*

[11] Wijsman, *Geneesk Tijdschr. voor Nederl. Ind.*, xxiv. 87., 244 (1884).

[12] Friedmann, *Ueber den Wahn* (1894), ii. p. 35, Note.

it is not necessary to consider them in detail, and, I shall now turn at once to the criticisms of the theory and to the views to which these objections lead us.

Arguments against the Psychic Theories.—The following is a brief summary of the chief objections urged against the theory we have just been considering, which regards hallucinations as evoked in consequence of exceptionally vivid ideational images penetrating into the region of sense, or, in terms of physiology, as the result of a current of centrifugal energy from the cells of the cortex exciting the basal ganglia into activity.

1. However vivid and energetic an ideational image may be, it can never receive the stamp of sensory reality. Schüle[1] cites Fechner's[2] experiments, and concludes that ideas of sensation can never rise to the level of sensation itself, that the want of the feeling of sensory affection leaves a gap which no psychic intention can bridge over. Kandinsky[3] insists that "a whole gulf" separates hallucinations, as well as normal sensory perceptions, from even the liveliest ideas. Among others,[4] Meynert has perhaps expressed himself most emphatically on this point.[5]

[1] Schüle, *op. cit.*, p. 140.

[2] Fechner, *Elemente der Psychophysik*, ii. pp. 469 *et seq.*

[3] Vict. Kandinsky, *Kritische und klinische Betrachtung im Gebiet der Sinnestäuschungen* (1885), pp. 135 *et seq.*

[4] Stricker, "Ueber Sinnestauschungen," *Wien. Med. Blatter*, 1878, p. 133, quotes the utterance of Hume that "the poet, even with the most glowing colours of his craft, cannot so depict a scene that his description should be taken for a real landscape. The liveliest thoughts do not reach to the dimmest impressions."

[5] Th. Meynert, "Ueber die Gefühle" in the *Sammlung von populär-wissenschaftlichen-Vorträgen über den Bau und die Leistung des Gehirns*, pp. 44 *et seq.*

"The mnemonic image of the most terrible burn is not to be compared in intensity, as regards its effect on the skin, with the faintest touch of a feather. The mental picture of the sun's bright disc has less to do with an impression of light than the least conceivable fraction of the glow-worm's faint radiance. The ear-splitting roar of a cannon as a mere image in the memory has less power to affect the sense than the immeasurably minute sound of a hair falling upon water. And though these images in the memory are caused in the first instance by sensory impressions, they have nevertheless as little in common with such impressions as an algebraic sign with the object for which it stands."

2. It is difficult to refer to ideational excitation visions which mock at all experience, the vision, for instance, of a blue dog, but it is easy to connect such an appearance with an illusory perception of a subjective impression of blue light. This view finds further support in the partiality which hallucinations seem to display for the primary colours, blue, red, and yellow (Hagen).

3. If an energetic ideational stimulus could arouse a corresponding activity in the sensory centres, hallucinations, and especially voluntary hallucinations, would be much more frequent phenomena of sane life than they are (Hagen).

Centrifugal Sensorial Theories.—In order to escape these difficulties, Hagen[1] refers the seat of hallucination to the subcortical sensory centres.

It is true that the seat of the excitation may be in the external sense organs or in the nerve path from the organ to the brain (*e.g.*, when flashes of light are seen in diseases of the retina, or auditory hallucinations experienced in diseases of the ear[2]),

[1] Hagen, *Die Sinnestäuschungen in Bezug auf Psychologie, Heilkunde und Rechtspflege* (1837); also the article "Zur Theorie der Hallucinationen," *Allg. Zeitschr. f. Psych.*, xxv. (1868), in which he develops and to some extent modifies his views.

[2] Köppe, "Gehörstörungen u. Psychosen," *Allg. Zeitschr. f. Psych.*, xxiv.

but it would be going too far to explain all hallucinations through physical affections of the sensory outposts. For, in the first place, no abnormality can be discovered in the majority of such cases; and next, even where such abnormality, and a consequent weakening of sensibility, is present, hallucinations are rarely found; thirdly, fallacies of perception may occur when the sensory nerves have been destroyed; and fourthly, a strong argument against this view is the intimate connection of hallucinations with psychoses and neuroses. In most cases, therefore, the seat of the hallucinatory process is to be sought in the sensorium, which is in a highly excited state, "so that stimuli playing upon it give rise to an exceptionally energetic functional manifestation in the efferent nerves proceeding from it, a manifestation which, as a rule, is wholly divorced from the control of the will." In a nerve leading to a muscle this is called cramp. "*Hallucination is cramp of the sensory nerves.*" The same effect, it is true, may also be produced by any stimulating substance in the sensorium, but such a cause is not easy to prove, and it is safer to assume a state of increased excitability, not in the sense of hyperæsthesia, but of a nervous congestion (*Turgor*), a tension of the nerve organ tending to relieve itself by centrifugal discharge. In support of this view Hagen cites the tendency of hallucinations to vanish on closing the eyes or darkening the room, the occurrence of elementary as also of unilateral hallucinations, and specially the frequency of visions, voices, etc., in epilepsy, and all states characterised by great *convulsibility*—that is to say, by a tendency of the nerve centres to centrifugal discharge,—and generally in diseases of which "cramp" is a possible symptom.

The changes thus taking place in the peripheral organ or the sensorium may either be interpreted correctly or misinterpreted, and thus transformed into illusions. It is often reported, for instance, that rudimentary sensations of light or sound appear first, and that the hallucinatory forms and words are only developed from them later. On the other hand, it sometimes happens that the imagination plays a part in the process from the beginning, some dominant image in the mind entering into and transforming the hallucinatory product. Such a process may be conceived as analogous to Romberg's "co-ordinated cramp." The impulse, motor in the latter case, is here ideational, and just as the psychic intention can in the one case give

rise to a muscular spasm, so in the other the ideational activity may cause a cramp of the sensory nerves. But it is not so much the idea in the mind as the heightened convulsibility of the subcortical centres which is the real cause of the hallucination.[1]

Hagen's view is adopted, amongst others, by Schüle,[2] who has further elaborated it.

If, he argues, in cases in which hallucinations occur after blindness and atrophy of the optic nerve of many years standing (Rudolphi), or with softening of the thalami (Esquirol), we assume that the co-operation, anatomical and physiological, of the "sense" is essential, we must suppose that the sensory tract in all its ramifications is involved with the cortical sphere in a pathological reaction. It is improbable, however, that the whole of the nerve path is implicated, and if we assume an intellectualising of the perceptions as they ascend the degree of sensory quality in a hallucination may be taken as a functional expression of the distance from the periphery of the nerve concerned. "*The timbre of the hallucination is the auscultation product of its more central or more peripheral nature.*" An irradiation which extends as far as the peripheral organ attains to full sensory expression. "The more central the stimulus the more inward and intellectual the tone." The pathological process may be conceived as a condition of heightened irritability with a specific morbid function: two causes may be assigned for this heightened irritability—(*a*) a weakening of the cortical inhibition and consequent increased independence of the sensory centres; (*b*) direct heightening of the irritability, generally resulting from some disturbance of assimilation. The specific nature of the sensory affection is to be regarded as *cramp* (Hagen[3]).

[1] In completing our historical survey it may be worth while to note that Grohmann (whom Hagen quotes) supposes a disposition to visual hallucinations in abnormal states of the venous blood, and to auditory hallucinations in abnormal states of the arterial blood. He also thinks that heart disease predisposes to visual hallucinations.

[2] Schüle, *op. cit.*, pp. 136-148.

[3] Be it noted, however, that Hagen's comparison of hallucination with cramp is misleading, if only for this reason: in the motor nerves the functional activity proceeds in a normal direction, while the process supposed to take place in the sensory nerves is reversed.

Fundamental Conceptions underlying all the Centrifugal Theories.—Before proceeding further it would be well to consider how these various writers were led to suppose a centrifugal process in hallucination, and to adopt a hypothesis which, especially at first, seems directly opposed to all physiological theories.

1. Since hallucinations in the psychological view were images of the memory or imagination which had attained to sensory vividness, and since the centres of ideation were now always conceived as the higher centres, it was necessary to assume a refluent impulse from the cortex to the sensorium, nor indeed were other indications of such a process wanting, for, as Griesinger had already pointed out, all thinking, all imagining, is accompanied by faint sensory echoes.

2. Hagen and the exponents of the sensorial theory were also led to suppose a centrifugal discharge, not, it is true, on the grounds just stated, but through the theory of "eccentric projection," then generally accepted and held to explain why the hallucinatory image is located in the external world.

3. A great number of cases were adduced which it seemed impossible to explain except on the hypothesis that the retina was also involved in the hallucination. Many writers (Griesinger,[1] Krafft-Ebing,[2] Schüle, Despine,[3] and Tamburini[4]) go so far as to assume in the case of a full-fledged hallucination a centrifugal current reaching to the peripheral organ.

[1] Griesinger, *op. cit.*, p. 90.
[2] Krafft-Ebing, *Die Sinnesdelirien*, p. 11.
[3] Despine, *Étude scientifique sur le somnambulisme.*
[4] Tamburini in *Revue scientif.* (1881), p. 139.

Sergi[1] goes a step further and assumes in every sensory perception a refluent wave. Lombroso and Ottolenghi have adopted his extreme view.[2] The results of Monakow's researches seem to furnish an anatomical basis for this theory. His description of the optical nerve tract is as follows[3]:—

"From each optical centre there proceeds a system of fibres, and in each centre a similar system terminates, and the various systems of projection-fibres are united through the system of the intermediate cells. Both in the primary and secondary divisions of the optical tract two systems of fibres run parallel to one another in opposite directions, and the systems of brain cells and intermediate cells constantly alternate." These filament systems, he proceeds, are so constructed that the coarser fibres of the optic nerve spring from the large multipolar cells of the retina and break up to form a network in the external geniculate body; the finer filaments arise in the superficial grey matter of the anterior corpora quadrigemina, and end in the retina; the axis-cylinder prolongations from the majority of the ganglionic cells in the pulvinar and the external geniculate body extend as visual projection fibres into the cortex of the occipital lobes, where they terminate for the most part in the nerve network of the fifth layer and become indirectly connected with the intermediate cells. On the other hand, the great pyramidal cells of the third cortical layer send their axis-cylinder prolongations into the region of the primary optical centres, where they spread out in a network. Between the primary and the secondary projection systems intermediate cells occur in the cortex and in the substantia gelatinosa of the primary centres.

Such a structure would explain another difficulty which meets us in the theories of hallucination we have just been considering. It would render plausible the conception of a centripetal current flowing alongside the centrifugal stream in the same channel at the

[1] Sergi, *Psychologie physiologique* (1888), pp. 99, 189.
[2] In *Revue philosophique*, xxix. p. 70.
[3] Monakow, *Arch. für Psych.*, xx.

same time, through which the co-operation of the subcortical ganglia and of the peripheral organ is announced in the cortex.

Nevertheless all the facts urged in support of this hypothesis admit of another explanation. To begin with, the psychological conception lying at the root of the whole theory has been already considered and rejected; while, as regards the presumption required to establish it, that the subcortical centres participate in all ideational activity, Tigges[1] points to the corollary that an injury to the former would involve an injury to the ideational process, and shows that such is not the case, since in subcortical sensorial aphasia due to disturbances of conduction between the temporal lobes and the centres in the medulla oblongata, though word-deafness occurs, the acoustic imagination remains intact and there is no loss of spontaneous speech.

Secondly, the "eccentric projection" theory rests, as James has already pointed out,[2] on "the confused assumption that bodily processes which cause a sensation must also be its seat. Sensations have no seat in this sense," he continues, "they become seats for each other, as fast as experience associates them together; but that violates no primitive seat possessed by any one of them. And though our sensations cannot then so analyse and talk of themselves, yet at their very first appearance quite as much as at any later date are they cognisant of all those qualities which we end by extracting and conceiving under

[1] Tigges, "Zur Theorie d. Hallucination," *Allg. Zeitschr. f. Psych.*, xlviii., vol. 4. His argument does not seem to me of much value, however.

[2] James, *op. cit.*, ii. pp. 31 *et seq.*

the names of *objectivity*, *exteriority*, and *extent*. It is surely subjectivity and interiority which are the notions *latest* acquired by the human mind."

Lastly, certain cases where the hallucinations move in accordance with the movements of the eye are often quoted as affording strong proof of a centrifugal current,[1] and also those cases where the appearances are unilateral, that is to say, where they always occur in the same half of the visual field. Griesinger has mentioned among other examples the case of a man who always saw a black goat at his left side. Some of these phenomena may be due to scotoma, etc., but as a rule there is no reason for supposing that they are not centrally conditioned. Séguin[2] noted such appearances immediately before the occurrence of hemianopsy. This is perhaps best explained (see Chapter V.) as a disturbance of the nerve tract which, though at first not severe enough to bring about hemianopsy, was yet sufficient to cause irritation of the visual centre.

The fact that hallucinatory percepts are sometimes followed by apparent after-images is also cited in proof of retinal action. Gruithuisen[3] gives the following experience of his own :—

"I dreamed I was showing a lady the beautiful violet colour produced by laying fluorspar on glowing coal. The experiment seemed to succeed so well that my eyes were blinded as though by a ray of sunlight. Thereupon I awoke, and found that I had a yellow spot in my eye. This spot gradually became violet-black.

[1] Among other writers, Wundt cites these appearances, *Grundzüge d. physiol. Psychologie*, ii. p. 356.

[2] Quoted by Paterson, "The Homonymous Hallucinations," reprinted from the *New York Medical Journal*.

[3] Gruithuisen, *Beiträge zur Physiognosie und Heautognosie*, p. 256.

On opening my eyes I saw it over against the window. It was darker than the other parts of the eye, and moved with the eye's movements over the objects in the room, like other illusions seen in the waking state." [1]

A similar case is that of the Hon. Mrs. Drummond.[2]

"I was dreaming of being in a drawing-room furnished with a variety of knick-knacks in glass and china, when my attention appeared to be arrested by a large green vase of particularly graceful shape. I felt myself gazing intently at this object, when I awoke very suddenly and completely.

"I occupied a few seconds in looking about me, collecting the letters which had been brought in, when a slight uneasiness in my eyes made me close them. I then saw the vase at which I had been staring in my dream appear within the closed eyelids in red, the complementary colour of green, exactly as it would have done had I looked as long at a real object and then shut my eyes."

These cases are, on the whole, borne out by the accounts of their own visual images given by Meyer[3] and Féré.[4] Less convincing is the evidence furnished by certain hypnotic experiments which yielded

[1] The account is not quite clear, and seems to indicate that the percipient was awake for some time before he opened his eyes. One is almost tempted to assume that, on first drowsily half unclosing, his eyes encountered a strong light stimulus which he supposed to be an after-image, a phenomenon very familiar to him, that in the dream the sequence of events was reversed (see above), and that the supposed after-image was an actual perception of light which produced a true after-image. Be that as it may, there is a noteworthy agreement between Gruithuisen's experience and the following case, for both percipients report that they wakened suddenly on experiencing a visual impression, the one through a glare of light, the other, as she expresses it, "suddenly, while gazing intently."

[2] Report, p. 145.

[3] G. Herm. Meyer, *Untersuchungen ueber d. Physiol. d. Nervenfaser* (1843), pp. 238-241.

[4] Ch. Féré, *Rev. philosoph.*, xx. p. 364.

apparent negative after-images of doubtful genuineness.[1]

But granting that in such cases the hallucinatory colours really do bring negative after-images in their train, it does not necessarily follow that the retina is involved in the physiological process.[2] Even Hering leaves it an open question whether the action takes place in the retina or in the brain, and Michael Foster, as quoted in the Report, says, "We have no right to suppose that the exhaustion takes place in the retinal structure only, it may occur in the central cerebral structures during the development of visual impulses into sensations, and indeed the chief part of it is probably of cerebral origin."[3]

Thus we see that these facts, even if we accept them, are very far from proving the theory of a refluent current, and a further series of phenomena often quoted in its support, which we shall discuss later,[4]—the frequent disappearance of hallucinations on closing the eyes or stopping the ears, the doubling of the hallucinatory image through a prism, its becoming coloured if seen through coloured glass, the appearance of complementary colours in crystal visions, the persistence of dream-images in the waking state, and so forth,—has really no bearing upon the argument.

4. We should be all the more chary of assuming a

[1] Binet, *Le magnétisme animal* (1887), p. 188; W. James and Carnochan, *Proceed. of the Amer. S.P.R.*, p. 98; *Borderland* (Jan. 1894), p. 225.

[2] Compare Bernheim, *De la Suggestion*, pp. 102-112; also compare below, Chapter VI.

[3] Foster, *Physiology* (5th edition), p. 1266.

[4] See below, Chapter VI., and also the note on James's experiments in Chapter V.

descending current in ascending nerve tracts since such a hypothesis is inconsistent with generally accepted physiological theories.

The possibility of such a process is not indeed to be rejected *a priori*. Though it was at first supposed that a nerve fibre could only convey a current in one direction, Du Bois-Reymond pointed out that it was not easy to conceive of a mechanism which would allow of a current passing in one direction only, and he succeeded in demonstrating that stimulation of a nerve at any part of its course produces negative variation at both its ends. Various observers, Schwann, Bidder, Gluge, Vulpian, have endeavoured to obtain experimental evidence of this identity of function by grafting together motor and sensory fibres; but their results are contradictory and ambiguous. Bert's experiments are more satisfactory. He grafted the end of a rat's tail into the middle of its back, and after the wound had healed he cut the tail off at the root, and showed that it was still sensitive—that is to say, that the nerves conveyed stimuli in a reversed direction. Kühne's experiments on the centripetal conductibility of the motor fibres also yielded positive results.[1]

But even if we attribute such a power of reversed conductibility to the nerves it is difficult to see how their activity could produce any appreciable effect, "since the nerve apparatus to which the refluent current would flow is so formed that it could not functionally respond to such a stimulus, supposing it reached it" (Hermann). And even if it could so respond, in order to explain hallucinations on this theory we should be forced to assume not a mere affection of the external organ, but a stimulus applied over a certain definite area of the retina of the same shape as the image seen; "and it is difficult to suppose that such an effect

[1] This short sketch is taken from the account in Hermann's *Handbuch d. Physiol. d. Nervensystems*, vol. ii., part i., pp. 9-14, where other evidence is also to be found.

could be produced by a downward impulse from the brain, in the absence of any special mechanism for directing the current to any particular part of the retina."[1]

Centripetal Theories.—Having seen sufficient reason for rejecting all these centrifugal theories of hallucination, we now pass to consider some of the many attempts which have been made to explain the phenomena on the assumption of a reverse, that is to say, of a centripetal process. Most of the writers who support this view seem more or less alive to its bearing on Esquirol's distinction between hallucination and illusion, but so bred into the bone is this time-honoured distinction that they do not at first so much as attempt to discover whether there are really any hallucinations in Esquirol's sense at all. They simply take them as proved, and proceed to set up new categories. Schlager,[2] for instance, distinguishes not only between hallucinations and illusions, but creates another class, abnormal sensations, strictly so called, which he endeavours to explain, speaking of olfactory cases, through polypoid growths in the mucous membrane of the nose, through concussion of the brain, apoplectic attacks, etc., that is to say, through inadequate stimuli. Whilst he was able to observe numbers of these phenomena, he could not succeed in meeting with any genuine hallucinations at all. Andr. Verga[3] classes these abnormal sensations with illusions, con-

[1] Report, p. 139. See, on the other hand, the quotation previously given from Monakow's description of the anatomical structure of the optical tract.

[2] L. Schlager, "Ueber Illusionen im Bereich des Geruchssinnes, etc.," *Wiener Zeitschr.*, N. F. I. 19. 20 (1858).

[3] A. Verga, *Gazz. Lomb.* (1857), 22.

trasting them, as "subjective," with "objective" illusions caused by physical processes in healthy persons, and supposes them to arise in the body either organically or pathologically. He distinguishes them as "sensorial," the result of defect or disease of the sense organs; "ganglionic," sensations associated with hysteria and hypochondria, and which, though arising from nerve stimulation, can be perceived without any reference to the part affected; and "intellectual," the fallacies common to undeveloped intelligences, or occurring in states of anxiety and confusion of mind. Along with these he retains true hallucinations, which he describes as being obviously due to a morbid state of the imaginative faculty, in extreme cerebral excitement, as opposed to illusions, which he attributes to enfeebled power of judgment associated with frequent lowering of the cerebral activity. Lazarus[1] considers that in hallucination the sensory nerves are stimulated throughout their course to the centre by internal processes, but he creates a new class, "visions," which he explains on the psychical theory.

According to Jolly,[2] the cause of false perception is to be found for the most part in hyperæsthesia of the sensory paths concerned, a theory of which he obtained experimental verification by the reaction of the acoustic nerve under galvanic stimulation in mental cases associated with auditory hallucinations. Stricker's[3] view is very similar.

The Identity of the Centres of Sensory Perception and the Reproductive Centres.—It is clear, however,

[1] Lazarus, *Zur Lehre von den Sinnestäuschungen* (1867).

[2] Fr. Jolly, "Beiträge zur Theorie der Hallucination," *Arch. für Psych.*, iv. (1874).

[3] Stricker, "Ueber Sinnestäuschungen," *Wien. med. Blätter* (1878).

that the whole controversy as to whether hallucination arises in the ideational or in the sensory centres, and whether the process travels centripetally or centrifugally, becomes meaningless when once we have seen adequate grounds for concluding that the centres of sensation and imagination are not locally separated, but occupy the same part of the brain, and that the difference in character between sensory perception and ideational reproduction corresponds only to a different degree of excitement in the same cells. Such in fact would seem to be the case.

Thus it appears that the subcortical ganglia, frequently identified as the centres of elementary sensation, should rather be regarded as the organs for reflex movement of the eye-muscles, for, as Longet, Flourens, and Schiff[1] have already pointed out, stimulation of the corpora quadragemina is followed by movement of the iris, and, according to Munk, when the visual centres, which he locates in mammals in the occipital lobes, are completely extirpated only the reaction of the pupil remains, and the animals experimented upon become stone blind.[2] Then again, the pupil reaction remains intact, its centre in the basal ganglia being uninjured, in unilateral or bilateral hemianopsia resulting from lesion of the anterior lobes, but it does not appear that sensations of darkness and light are still experienced in the eliminated part of the visual field, as we should expect them to be if the subcortical centres were indeed the seat of primitive light sen-

[1] Schiff, *Lehrb. d. Physiologie.*

[2] Contrary results, those of Schrader for instance, perhaps admit of the simple explanation that the removal was not quite complete.

sations. The sufferers neither avoid obstacles nor flinch from threatening movements and gestures.

Various pathological cases have been quoted to prove that within the occipital cortex one part is connected with sensation and another with ideation.[1] They are better explained, however, as James[2] explains them, by disturbances of conduction between the occipital lobes and other parts of the brain.[3] On

[1] Munk, "Sehsphäre und Raumvorstellung," *Internationale Beiträge zur wissenschaftl. Medic. Festschr. für Virchow* (1891), holds that the ganglionic cells which bring about the perception of the constantly changing retinal images cannot at the same time be concerned with the reproduction of memory images, and that, besides elements of perception, there are ideational elements spread over the whole visual area. "We may suppose," he continues, "that the perceptive and ideational elements are situated in different layers in the cortex, but so close together that the experimenter cannot injure the one without injuring the other." If the gaze is prolonged or intent, the more transitory excitation of the perceptive elements as they return to rest is communicated to the ideational elements, where it produces certain more persistent material changes.

[2] W. James, *Principles of Psychology*, ii. p. 73.

[3] *Ibid.*, i. pp. 41-52. "All the medical authors speak of mental blindness as though it must consist in the loss of visual images from the memory. It seems to me, however, that this is a psychological misapprehension. A man whose power of visual imagination has decayed (no unusual phenomenon in its lighter grades) is not mentally blind in the least, for he recognises perfectly all that he sees. On the other hand, he may be mentally blind with his optical imagination well preserved; as in the interesting case published by Willbrand in 1887. In the still more interesting case of mental blindness recently published by Lissauer, though the patient made the most ludicrous mistakes, calling for instance a clothes brush a pair of spectacles . . . he seemed, according to the reporter, to have his mental images fairly well preserved. It is in fact the momentary loss of our *non*-optical images which makes us mentally blind, just as it is that of our *non*-auditory images which makes us mentally deaf. I am mentally deaf if, *hearing* a bell, I can't recall how it *looks;* and mentally blind if, seeing it, I can't recall its *sound or its name.*" The fact that in most of such cases an impairment of optical imagination (besides mental blind-

the other hand, direct evidence for the identity of the ideational elements with those of sensory perception is furnished by severe cases of hemianopsia, where the patient loses his visual images simultaneously with his sensibility to light, and that so completely that he does not even know what ails him. "To perceive that one is blind of the right half of the field of view one must have an idea of that part of the field's possible existence. But the defect in these patients has to be revealed to them by the doctor, they themselves not knowing that there is something wrong with their eyes. What we have no idea of we cannot miss; and their failure definitely to miss this great region out of their sight seems due to the fact that their very idea and memory of it is lost along with the sensation. A man blind of his eyes merely sees *darkness*. A man blind of his visual brain-centres can no more see darkness out of the parts of his retina which are connected with the brain-lesion than he can see out of the skin of his back. He cannot see at all in that part of the field, and he cannot think of the light which he ought to be feeling there,

ness) takes place is easily explained by supposing that not only the connecting tracts are cut off or destroyed, but that the visual area itself is affected. As a matter of fact, in all cases of mental blindness where there has been a post-mortem examination, disturbances in the occipital lobes have been found. For literature see Friedr. Müller, *Ein Beitrag zur Kenntniss der Seelenblindheit* (Marburg, 1892); compare also the cases reported by A. Pick in the *Arch. für Psych.*, xxiii. 3, where a certain degree of deafness was associated with mental deafness. Flechsig, who thinks he can prove that the association does not occur through direct connection between the separate sensory areas, but indirectly through "association centres," places psychic blindness, aphasia, etc., on the same side, and even professes to localise the several kinds of disturbed association, all of which he refers to various parts of his "left posterior association centre."

for the very notion of that particular *there* is cut out of his mind."[1]

Pelman's and Kandinsky's Localisation Theories.—Even when the identity of the sensory and reproductive centres is agreed upon, there is yet room for differences of opinion concerning the nature of the hallucinatory process; but before we proceed to consider these it may be as well to note the localisation theories of some writers who, not content with distributing the perceptive processes associated with hallucination between two classes of brain-centres, have, by drawing up complicated schemes, still further confused the question. Thus Pelman[2] holds that the sensory stimulus becomes perception in the subcortical centres, conscious perception [apperception] in those of the cortex, and conception and judgment in the frontal lobes. When the normal activity of the frontal lobes is suspended the cortical region attains to greater independence, and hallucination arises as conscious perception. It is recognised as something strange, but for lack of the critical faculty, not as something morbid. Kandinsky's scheme is

[1] W. James, *op. cit.*, ii. p. 73; also Binet in the *Rev. philos.*, xxvi. p. 481; and Dufour, in the *Revue Méd. de la Suisse Romande*, 1889, No. 8, cited in the *Neurologisches Centralblatt*, 1890, p. 48. Patients like those described by James are in the same case as persons born blind, who have never had any optical imagination at all. Stricker, *Wiener Med. Blätter* (1878), p. 83, writes as follows:—"A man fifty years of age, who had been born blind, told me he had no idea of darkness. In reply to my questions he said that he had heard folk speak of darkness and light, and he often wondered about it, but was unable to conceive it, or form any idea of it whatever. When I asked him if he could not even imagine something different in front of his eyes from the back of his head, he replied that it was inconceivable to him."

[2] Pelman, *Zwangsvorstellungen u. ihre Behandlung.*

still more involved. Though his writings[1] are otherwise distinguished by critical acumen in dealing with the various hypotheses, he describes no less than five different centres as concerned in the hallucinatory process: the subcortical centre of perception, the sensory centre in the cortex (for apperception), the centre of abstract (unconscious, or semi-conscious) ideation, the motor cortical centres of speech, and the centre of fully conscious thought, which is also the organ of "preapperception."

Grashey[2] rightly combats such strained theories of brain localisation, and declares that "it is a great mistake to busy oneself about brain-centres which have not been proved to exist, and that theories so founded are more of the nature of circumlocutions than of true explanations." We may therefore abandon as useless further inquiry into these and similar attempts.

False Perception a Phenomenon conditioned by Disturbed Association.—Meynert takes a decided step forward, for, while he distinguishes between sensory and ideational areas in the cerebral cortex, he points out that hallucinations are not a result of heightened cortical excitement, that they do not occur during periods of clear thought but at times when the higher functions are relaxed."[3]

Speaking of the cortex,[4] he says:—"It cannot 'hallucinate'—that is to say, it cannot reproduce sensations of light, colour,

[1] Kandinsky, *Kritische u. klinische Betrachtungen im Gebiet d. Sinnestäuschungen* (1885); *Arch. f. Psych.* (1881).

[2] Grashey, "Ueber Hallucinationen," *Münch. med. Wochenschr.* (1892), Nos. 8 and 9.

[3] Compare above, pp. 71 *et seq.*

[4] Th. Meynert, "Das Zusammenwirken der Gehirntheile," a lecture delivered before the International Congress at Berlin, 1890;

sound, or smell in a sensory manner. A hallucination is always an inference which arises from the excitation of a subcortical station, and which the cortex interprets in accordance with the ruling thoughts, emotions, and opinions of the moment. If the cortex aimed at giving an object sensory embodiment it would not succeed through heightening of its own activity. For this would inhibit the excitation of the external corpus geniculatum or of the retina, as well as the subcortical contribution of a feeling of innervation, which the cortex translates as spatial extension. The excitation of the organ of association (the cortex) is at its height when purely occupied with conclusions and the work of comparison and judgment, but the perceptive power is then feeble. It is a mistake to describe a man who is absorbed in concentrated thought as 'dreamy' or '*distrait*,' though contemporaneous impressions escape him. Such is not the condition in which deceptive phantasms make their appearance. During intense cortical excitement the irritability of the sensory organs and their centres in the subcortical regions is suppressed. It is with the approach of sleep that the exhausted thinking power dies away, and that the excitability of the cortex is lowered, and it is during sleep that phantasms appear. Why do the subcortical centres not sleep as well? . . .

"Having learned that when the cortical elements are in a state of tension the activity of the cell colonies in the lower brain is proportionately feeble, and *vice versâ*, we have next to note that not all of the myriad cortical elements capable of consciousness are awake at the same time. As Fechner expresses it, there is always a surplus in partial sleep, and only those which are awake or 'alert' at the moment are represented in the consciousness. Like the assimilative and respiratory functions of an animal when hibernating, the nutritive activities of the sleeping part of the cortex are lowered. We call the activity of the brain cells their state of excitability. Virchow has shown that the epithelium cells of the kidney swell when stimulated; the muscle cell swells, and similarly in the nerve cell the mole-

Sammlung von populär-wissenschaftlichen Vorträgen, pp. 219 *et seq.*; "Ueber Fortschritte im Verständnisse krankhafter psychischer Gehirnzustände (1878); "Von den Hallucinationen," *Wiener med. Blätter* (1878), No. 9.

cular activity of assimilation must be associated with a heightened functional activity, during which, according to Fechner, the excitement of the cortical elements oversteps the threshold of consciousness. In the highest brain activity of all, such as the delicate play of association, in which out of large groups of elements a certain number only are alert, and by the excitation of the association filaments arouse other element-groups in remote parts of the brain to function simultaneously or in an unbroken sequence, the assimilative power is enabled to select the appropriate elements only through the specialised absorptive energy of the cell units. These delicate operations of selection and grouping in the nutritive processes of the cortex must be distinguished from the mere flooding of the cortical tracts with the stream of blood by the action of the heart. The alert cells supply themselves with nutriment, taking it up by endosmosis from the pervious walls of the capillaries. This delicate capillary action does not extend, however, to the great blood-sea in the heart, and the larger branches of the blood-vessels must be pumped full by the action of the heart. From each of the three great arteries of the cortex short vessels proceed to the base of the brain. The cortical and sub-cortical blood-vessels are collateral, and if the same quantity of blood enters the great artery, the more there flows to the base the less goes into the cortex. But the cortex, in the act of hard thinking, becomes a powerful suction pump and draws off from the cell colonies of the corpus geniculatum externum and other basal centres the stimulus supplied by a full flow of blood. *If*, however, the cortical elements are only half awake or exhausted, as when the individual is drowsy or inattentive, the molecular attraction absorbs little out of the common blood-supply through the branch running up to the cortex, and the vessels supplying the base of the brain, and which branch off lower down, receive a larger share."[1]

[1] This theory that the nerve elements of the cortex recuperate themselves through molecular attraction has been propounded by Virchow and further developed by Wundt. The best evidence for it is to be found in the results of Meynert, Heubner, and Duret, who show that owing to the long and winding course of the arteries the blood-supply in the brain is at low pressure and would be insufficient to reach the cortical cell colonies unless we credit them with the power

Thus, according to Meynert, hallucination may be regarded as an inference drawn by the organ of association during lowered activity of the hemispheres from a message conveyed to it by the excitation of the sensory tracts; in a word, it "depends on the mutual relations *quoad* excitability between the frontal lobes and the subcortical centres," with which the sensory nerves are associated. While Jolly emphasises the actual hyperæsthesia of the specific sensory nerves, Meynert considers their heightened activity due to the remission of the inhibitory function of the frontal lobes.

But Meynert's service consists not so much in the development of his special theory of hallucination, which we are forced to reject if only because of the function which he attributes to the subcortical ganglia, but because, in referring all sensory fallacies to the lessened excitability of the higher cortical centres ("the organ of association," as he calls it), he shows that they are subject to a general law. When we translate this law from his terms into our own we find that we have arrived at the same conclusion which we saw reason to draw from the facts considered in Chapters I. and II., viz.: that *hallucination is a phenomenon conditioned by disturbed association.*

James's Theory.—W. James adopts this view, that the same cortical elements are concerned in sense

of molecular attraction. Further support for the theory that hallucinations arise subcortically is furnished by the results of Meynert's experiments in weighing the brains of insane subjects: "Naturexperimente am Gehirn," *Jahrb. f. Psych.*, x., vols. 2 and 3; "Ueber Fortschritte im Verständniss der krankhaften psychischen Gehirnzustände" (1878), *Wiener med. Blätter*, 1878, No. 9.

perception and ideation, and makes it the starting-point of his own theory of hallucination, which is to the following effect:—If the centres are one and the same, then the degree of intensity in the process must differ according as the currents flow in from the periphery or from neighbouring cortical regions. Münsterberg[1] finds the sufficient cause for these differences of reaction in the adaptation of the cerebral mechanism to the external world, for if we could not distinguish between reality and fantasy it would be impossible for our actions to be adjusted to the environment. The discontinuity between the two kinds of processes must mean that when the greatest ideational intensity has been reached some resistance is encountered which only a new form of energy can overcome. If the current from the periphery furnishes the requisite energy the resulting process assumes for our consciousness a sensory character. We may suppose that this process consists in a new and more violent explosion of the neural matter occurring at a lower level than normally, and we may take it that the resistance to be overcome consists in two factors: first, the intrinsic molecular cohesion of the cells, a cohesion which a sudden inrush of energy from the periphery is able to tear apart, but which is proof against the feebler currents flowing in through the association-paths. The latter might indeed effect the same result if they could accumulate in the nerve elements. But—and here we have the second factor in the resistance—this is generally impossible because of the free communication of the cells with

[1] Münsterberg, *Die Willenshandlung* (1888), pp. 129-140.

each other through the association-paths, in consequence of which the incoming cortical current flows out again, waking the next ideas. The tension in the cells thus never rises to the higher explosion-point. *If, however, from any cause the outflow is blocked wholly or in part, the inflowing nerve currents accumulate and reach the maximal explosion-point, the process of perception takes place and the result is a hallucination.*

This felicitous explanation unites in itself many advantages. The view of hallucination as depending on restricted or disturbed association is in full agreement with the facts discussed above on pp. 71 *et seq.*;[1] and with the law, known to hold good generally,[2] that the intensity of a state of consciousness is in inverse proportion to its power of exciting a new state. Its resemblance to Hughlings Jackson's view of epilepsy

[1] Moreau; *Du Haschisch*, etc., represents insanity as a special state of being. The dream-state, he says, is its complete physiological or normal expression. In discussing waking hallucinations, too, he notes the disturbance of consciousness which accompanies them in a more or less marked degree.

[2] James, *op. cit.*, ii. p. 124. "It is the halting-places of our thought which are occupied with distinct images. Most of the words we utter have no time to awaken images at all, they simply awaken the following words. But when the sentence stops, an image dwells for a while before the mental eye." This accounts for the vividness of the images which haunt our falling asleep (when dissociation of consciousness is setting in), and which sometimes appear as complete hallucinations (hypnagogic hallucinations). Compare Maury's description in *Le Sommeil et les Rêves;* Taine, *De l'intelligence*, i. p. 50. New sensations not yet associated (such as a flannel bandage round the body or the gap of a lost tooth) are more intensely felt than when one has "got used" to them. The dissociation of the dream-state also accounts for our absurd misinterpretations and exaggerations of the sense-impressions which reach us during sleep. See above, pp. 53 *et seq.*

permits us in a simple manner to explain, on similar principles, these phenomena, which Hagen had already attempted, but without conspicuous success, to bring into line.

Nevertheless, it seems to me simpler, so long at least as the action of afferent currents from the periphery is not absolutely excluded, and therefore so long as such action may be inferred, to attribute the sensory character of false perception to this cause. In so doing we shall, without losing the advantages of James's[1] theory, observe more closely the law of parsimony by reducing fallacious perceptions to one type, Esquirol's illusions. As we pursue our inquiry we shall come to see that all false perception is an anomalous reaction of the brain to sensory stimuli, and the hallucinatory process only a special form of that process which accompanies all objective perception. Thus we shall restore two long separated provinces to the dominion of the same fundamental law.

Schematic Presentation of the Physiological Process in False Perception.—When a stimulus from the periphery is conducted to the cortex it excites in the place first affected, *A*, a process, *a*, which tends to irradiate thence on all sides. The irradiation naturally takes place in the direction of least resistance, and what this open path shall be is decided by three principal considerations. First of all it will be the path to the element, or rather to the closely connected element-group [M + N + O + . . .] which has been most frequently and actively associated with A,

[1] The instances given by Prof. James, *op. cit.*, p. 99, would be easy to explain on this theory also.

"either simultaneously or in unbroken sequence."[1] Thus a directly stimulated element and an indirectly stimulated element-group are aroused to activity at the same time, and the sum of the processes $a + [m+n+o+ \ldots]$ arising from the disintegration of the neural matter represents a cerebral state which is accompanied by a psychical fact—a perception.

In the next place, however, it is to be noted that the stimuli penetrate into the cortex, not singly, but several at once. A number of directly stimulated elements, $A, B, C, D, \ldots$ are aroused into activity; a number of processes, $a, b, c, d, \ldots$ take place in varying degrees of intensity. Each of these processes irradiates in the direction of least resistance to certain groups $[M+N+O+ \ldots]$, $[R+S+T+ \ldots]$, $[O+P+Q+R \ldots]$. Some of the primary processes,

[1] Münsterberg, *Beiträge zur experimentellen Psychologie*, i. p. 129. "Now, if two sensations are in consciousness simultaneously, the physiological inference is that two locally-separated ganglion-complexes in the brain are in a state of excitation at the same time, and it is fully in agreement with the rest of our neuro-physiological and anatomical science to conclude that in such simultaneous excitation in two parts the process discharges into the conducting path which unites them. This path, whose two end stations are affected, serves in a certain measure to equalise the two excitations, and in whatever way we choose to represent the molecular process of the neural activity, it is evident from any standpoint that two simultaneously excited regions bring their connecting paths into a state of excitement with them. Thus not only does there remain behind a functional disposition of the ganglia themselves to respond more easily to a repetition of the same stimulus, but a functional disposition of the association-path to carry more easily than all the other outgoing paths the excitation of one end station to another which was formerly excited with it—or, to put it shortly, when one of these two ganglion-complexes is active the process will be passed on by this connecting path (which brain physiology supposes to consist in certain nerve filaments, therefore called association-filaments) to the other cortical region." For a fuller account see W. James, *op. cit.*, ii. pp. 580 *et seq.*

b and *c*, are but feeble and set free only a slight discharge in the groups which they arouse. Some elements are members, not of one, but of several element-groups (*N*, *O*, *R*), and in them the explosion is most violent; but through these common members, as well as through direct connecting paths, the level of tension in the various groups is partially equalised. In short, the resulting brain-state is extremely complex, and constitutes (together with the perception which accompanies it) the reaction of the brain to the sum of the sensory stimuli—in a fully waking state to the sum of *all* the stimuli—acting on the periphery and thence conducted to the cortex. That in this simultaneous action of several stimuli the path of least resistance for the irradiation from *A* or *B* may, and frequently does change, can easily be understood. For instance, the path might lead, as described above, to [*M*+*N*+*O* . . .], but the resistance in the path from *A* to [*R*+*S*+*N*+*T* . . .] might be very little higher, and this group being also closely connected with *B*, which is stimulated at the same time as *A*, it is possible under certain conditions that group [*M*+*N*+*O* . . .] might be entirely disposed of, and the discharge of the processes *a* and *b* both reach only the elements [*R*+*S*+*N*+*T* . . .].

Thirdly, the resistance which the process *a* meets with in its efforts to discharge in the various association-paths depends on the cerebro-static condition which obtains at the moment of its occurrence. Some of the elements are exhausted, in others the former excitations still reverberate more or less, and in yet others through summation of stimuli, still unconscious, a high degree of tension has been reached, which only awaits a slight impulse to overstep the threshold of consciousness.

Normally, however, such an impulse is not forthcoming. The sensational level is only reached when from some physiological or pathological cause dissociation—the characteristic state underlying all sensory delusions—is present. If, for instance, through exhaustion of the element-groups usually associated with *A*, or through other obstructions, the paths normally open to the irradiation of the process *a* are closed, and if on the other hand a certain close-knit group of elements is in a state of high tension, then when *A* is stimulated, *a*, being able to discharge only in the direction of the least resistance, will be forced to discharge towards this group which has perhaps never before been affected by it. Now supposing that the tension in this group is so high that the slightest impulse brings about the explosion, and that the path to it is wide open, then the current flowing towards the first affected element, *A*, cannot accumulate there. That is to say, the process *a* will only take place feebly, and the resulting brain-state in its totality will be almost[1]

[1] With regard to this "almost" I would call the reader's attention to an observation made by several authors chiefly concerning dream-phenomena. The dream-figures frequently show, in spite of a resemblance to the person dreamt of complete in every other detail, a more or less striking difference in particular features—for instance, in a familiar face an enormous nose will appear. It is rarely, however, that the contrast between the liberated element-groups and the sensation which plays the part of the liberating stimulus is so great as in Kraepelin's experience, "Ueber Erinnerungstäuschung," *Arch. für Psych.*, xviii., vol. i. p. 235. He dreamed in November 1884 of one of his most intimate friends, who was in reality a short man with a black beard, but appeared in the dream tall and slight, with a small moustache. The difference between the dream image and the memory image could hardly have been more complete, yet it did not affect the dream consciousness at all.

exactly the same as if the element-group in question were alone active, as if it had been started not by process *a* but by an irradiation, let us say, of process *n*, which usually starts the activity in this particular element-group. The psychical concomitant of this process is therefore a sensory perception, which yet lacks the special sensory stimulus normally associated with it,—in other words, it is a perception without objective basis, a *hallucination.*

But dissociation, or rather the exhaustion of the neural elements by which it is conditioned, acts also in another way. If the excitability of the neural elements is lowered, a great number of the stimuli flowing in to the cortex are not powerful enough to start the corresponding processes *b, c, d,* and so forth. The process *a,* which alone emerges, no doubt succeeds in discharging towards an element-group and arousing it, but the resulting cerebral state taken as a whole is not the same as the state that would have been produced if other processes which have now dropped out (*b, c, d,* etc.) had contributed to the result. Some of its constituent parts, it is true, are present, but many of the usual "interference waves" are wanting. The psychical concomitant of this brain-state is a perception such as *a,* or the sensory process started by *a,* can evoke. But it misrepresents the sensation for which it stands because it is incomplete, and lacks the correction and adjustment which the dormant elements in consciousness could alone have supplied. It is, in a word, an *illusion.*

Since the view here expressed, in so much as it supposes all false perception to originate in the action of sensory stimuli, reduces hallucination and illusion to one category, it is clear that the processes

just described by these names do not correspond with Esquirol's definition.[1] *I have distinguished as "illusions" the phenomena which result from the suppression of certain processes, and as "hallucinations" those which are caused by an act of forced association;* and I have indicated that both processes are conditioned in the first place by the dissociative state. Where the contrary is not expressly stated I shall henceforward use these terms in the sense just ascribed to them.

It is to be observed, however, that the two processes seldom or never take place separately. No hard and fast line can be drawn between them, though, generally, either the *plus* or *minus* quality predominates, and the phenomena can be classed as "hallucinations" or "illusions" accordingly.

Some Objections refuted.—This attempt of mine to reduce all false perception to a single physiological type—Esquirol's illusions—may seem to have been disposed of beforehand by James in his criticism of Binet's[2] *point-de-repère* theory, but I shall endeavour to show[3] that the facts which led James to assume central initiation in a few cases at least are not really incompatible with the view of false perception as illusion in the old sense. Be it noted, however, that

[1] I reiterate this here, although it is self-evident enough, because in the notices and criticisms of the German edition of this work my standpoint has been so often misunderstood. The objection has been raised, for instance, that the phenomena commonly called "apperception illusions" (see p. 118) cannot be regarded as "Ausfall-Ergebniss." Certainly not, and that is just why I have classed them not as illusions but as hallucinations, in my sense of the term.

[2] Binet in the *Rev. Philos.*, xviii. (1884); Binet and Féré, *Magnetisme Animal.*

[3] Compare below, Chapter VII.

if his negative results do not militate against Binet's theory, the experiments of the latter do as little to establish it. Both views seem to be founded on the same misconception of the nature of the facts. That hallucinations may be doubled by a prism, enlarged by a magnifying-glass, and reflected by a mirror, no more proves their peripheral origin than their failure to respond to such tests disproves it.

Of course, by refusing to accept central initiation we must not be understood to deny the possibility of sensory deception originating in a pathological condition of some part of the central organ, but we should then regard the resulting phenomenon, to avail ourselves once more of Esquirol's definition, as an illusory interpretation of the morbid stimulus. The majority of hallucinations are highly complex phenomena, and require for their production the co-operation of many widely separated element-groups. "They do not correspond to the appearance of a simple memory such as we suppose to be deposited in these centres."[1] For a pathological stimulus to appear in consciousness as a full-fledged hallucination it must first irradiate from the morbid groups by the association-paths (as indicated in the scheme given above), and arouse the activity of the various elements required for its manifestation. Such a conception as Grashey's, of an independent activity of the sensory cells, without communication through the association-paths—a kind of "self-explosion" or

[1] Mendel, "Der gegenwärtige Stand der Lehre von der Halluc.," *Berliner Klin. Wochenschr.* (1890), p. 614. We should otherwise be obliged to revert to the crude view that each separate cell contains a certain sense perception, however complicated that sense perception may be.

"molecular concussion" (Ferrier) and consequent renascence of the sensation—is quite chimerical. It may moreover be met by Neumann's contention, quoted on page 111, viz.: that among the incalculable number of possible element-combinations the contingency of any familiar combination (that corresponding to an object, for instance) turning up would be too remote to merit consideration.

CHAPTER V.

FACTORS OF FALLACIOUS PERCEPTION.

The dissociated State—Definition—Pathological and Physiological Causes—Varieties of Dissociation—Action of Dissociation—The Stimuli—Post-mortem Reports—Excitation of the various Senses—Cramer's Theory.

OF the separate factors which are concerned in the production of fallacious perception, the state which we have found to be essential for its occurrence, and which we have called *dissociation*, is the most important, and has the first claim on our attention.

By dissociation is here understood that state in which the nerve stimulus no longer flows through the channels determined by habit, and by the co-operation of simultaneous stimuli, because inhibitions, or obstructions, whether from pathological or physiological causes, have been set up in the normal association-paths, or obstructions which normally exist in other connecting tracts have been weakened or altogether abolished.

Pathological Causes of Dissociation.—We can only glance here briefly at the pathological causes which may give rise to dissociation, and refer the reader to Chapter II., where the various morbid states which bring hallucinations in their train have already been described. Further inquiry into the causes which

give rise to these states does not come within the scope of the present work.[1]

Physiological Causes of Dissociation.—One of the chief physiological causes of dissociation is the obstruction caused by the exhaustion of the elements themselves, for instance, in normal sleep; whether we explain this exhaustion with Pflüger[2] as directly due to the great expenditure of energy in the waking state, with its resulting destruction of nerve tissue, or with Preyer[3] as due to the readily oxidisable products of fatigue (lactic acid) reducing the amount of the respiratory oxygen of the blood available for the ganglionic cells, or with Rosenbaum[4] as a result of the nervous substance becoming watery in consequence of a swelling up of the nerve cells. Pathological exhaustion acts in the same way, *e.g.* in anæmia, or other disturbances of nutrition, morbid contraction of the arteries, atheromatous processes, poisons, etc.

In psychical concentration a reverse process brings about the same result. The tension in certain selected element-groups is heightened and their irritability increased. But this takes place at the expense of the

[1] The prevalent practice of referring hallucinations to the disease itself instead of to the mental disturbance induced by it has filled pathological manuals with examples drawn from affections of a more or less opposite character, which have come to be regarded as themselves causes of fallacious perception, for instance, hyperæmia and anæmia of the brain and its membranes, qualitative changes of the blood, as in cases of poisoning, diseases of the heart, abdomen and lungs, long exposure to heat and cold, the breathing of rarified air or noxious gases, extreme pain, etc.

[2] Pflüger, *Pflüg. Arch. f. d. ges. Physiol.*, x., pp. 658 *et seq.* (1875).

[3] Preyer, *Ueber die Ursache des Schlafes* (Stuttg. 1877); compare his Art. "Schlaf" in Eulenburg's *Real-Encyklopädie*, 2nd ed., Bnd. xvii.

[4] E. Rosenbaum, *Warum müssen wir schlafen* (Diss. Berl. 1892).

non-selected elements whose irritability may be thereby reduced to a minimum, causing a state of dissociation or splitting off to ensue—a state which we may regard with Wundt[1] as arising out of neurodynamic and vasomotor processes, "according to the general principle which holds good for any system of elements where a struggle for equilibrium is going on, that whenever an expenditure of energy occurs at one point there will be an increased flow to that point from all the neighbouring parts having a higher tension." That is to say, the consumption of energy caused by fixed attention compels an inflow to counterbalance the waste, and this is expressed in a lowered irritability of the elements yielding the supply.

A fact has been observed which aptly illustrates and supports this view of one-sided fixed attention as dissociation—not indeed as a general breaking up, but as a "splintering" or splitting off,—the fact, namely, that two separate complexes may be subject at the same time to different illusions, and each be unaware of what is impressing or occupying the other. It is somewhat remarkable that the following interesting case given by Gurney has received no further notice:—[2]

P——ll (in the hypnotic trance) was told several times, "It has left off snowing," and then when woke and set to the planchette[3] he was made to read aloud. The writing which appeared was, "*It has lfeft sn*——," and while this was pro-

[1] Wundt, *Hypnotismus und Suggestion*, p. 58.

[2] Gurney, "Peculiarities of Certain Post-hypnotic States," *Proceed. of the S.P.R.*, vol. iv., 1886-87, pp. 319 *et seq.*

[3] An instrument adapted to automatic writing, a small board supported on three feet, one of which is a pencil.

ceeding the reading was bad and stumbling. When the writing stopped the reading became appreciably more correct and fluent. Re-hypnotisation afforded a glimpse of the condition in which the secondary intelligence had found itself. Asked what he had been doing, the "subject" replied, "*Trying to write* 'It has left off snowing.'" Asked if he had been reading, he said, "Reading! No, I haven't been reading," and added, "something seemed to disturb me." "How was that?" "Something seemed to keep moving about in front of me, so I got back into bed again." "Didn't Mr. Gurney hold a book and make you read aloud?" "No, somebody kept moving about. I didn't like the looks of them. Kept wandering to and fro. Horrible, awful! I thought to myself, 'I'll get into bed.' It looked so savage—quite unnerved me," etc., etc.

The experiment was repeated. The "subject" was told, "It has begun snowing again." The writing was now an almost illegible scrawl of *It begun snowing*. Meanwhile he was reading about Humpty-Dumpty, slowly and with omission of words, but with clear comprehension and decided amusement. On being re-hypnotised, he was again completely unaware of the reading, and gave the same description of the way that he was disturbed in writing. . . .

It was curious to observe how the act of writing sometimes seemed to affect P——ll's power of articulation; the difficulty seemed to be of a distinctly physical sort, and he himself several times remarked that it seemed to "draw" the right side of his mouth, without affecting his comprehension of what he read. It seems just possible that this may be connected with the proximity of the cerebral centres of speech and of movement of the right arm (see *Le Magnétisme Animal*, by MM. Binet and Féré, p. 250). At the same time the difficulty undoubtedly seemed to be less when the acts accomplished were of a semi-mechanical kind; as when he had to write the numbers from 100 backwards, and simultaneously count the numbers from 1 forwards, and *vice versâ*.

This case shows clearly how the illusion is brought about. The sensory impression mounts from the eye to the cortex and there arouses the elements selected by attention. The perception of reading which

engaged the entire interest of P——ll took place in the normal consciousness. Faint echoes of the process penetrated to the complexes concerned in the sub-conscious writing, and there set agoing a process characterised by the want of the group then being used in the other complex to convey the consciousness of the visual impression. In consequence of the uneasy feeling caused by the simultaneous obstruction of both activities the sub-conscious sensory delusion assumed a distressing character, as described by the subject. The process was reversed in the movements of the right hand which gave rise to corresponding processes in the subliminal complex, faint echoes of which succeeded in penetrating through almost impassable channels of association and produced in their turn in the complex used in the normal consciousness effects proving that in this complex the groups necessary for the correct interpretation of the stimulus were altogether absent. The process was ascribed to the activity of the elements working in *this* complex, and thus referred to the corner of the mouth and sensibly perceived as twitching and quivering of the right corner of the mouth.[1]

There is still another way in which a state of dissociation may be brought about. It may, as we have already seen, be due to the exclusion of external sensory stimuli, and this absence of external excitation acts in two ways—first directly, and secondly, by turning the attention inwards, on what at other times

[1] On another occasion only the sub-conscious sensory delusion could be demonstrated. P——ll, on being re-hypnotised after writing, did not remember to have been reading, though he did recall that his mouth had moved up and down as in eating.

are but dimly perceived and little noted sensations having their source in the organism itself, and thus loosening and breaking up the complex.

Besides the individual experience which we have all had of this fact, there are special experiments which tend to prove that the exclusion of external stimuli favours the occurrence of fallacious perception.[1] Baillarger maintains[2] that in the insane deaf auditory hallucinations are nearly always present, and Gutsch[3] observed them almost exclusively in mental disturbance due to solitary confinement. Hypnagogic hallucinations, dreams, and the tendency to see ghosts and visions in the dark also point to the same cause. In the insane it is frequently found that there is a respite from visions and voices during the day followed by violent attacks at night. Conversely, in many patients the perceptive power of the hallu-

[1] Bielski, *op. cit.*, seeks to explain this by supposing that other centres normally inhibit the reproductive activity of the ideational centres, and that as these inhibiting centres act continuously like the vagus nerve centres which inhibit the heart, they must be in a tonic condition. As a matter of fact, Langendorff seems to have succeeded in proving that this tonic condition is maintained principally through external stimuli, especially those of sight and hearing: a frog which had been made blind and deaf croaked straight on like the brainless frog in Goltz's experiment. It would thus appear that the inhibiting centres are started into activity through the excitation of the sensory centres. Jolly thinks that hyperæsthesia of the visual organ would explain hallucinations occurring in the dark. When our eyes are used to the dark they are able to perceive smaller differences of illumination than in a strong light, and this hyperæsthesia may, he thinks, suffice to create visions out of the slight excitation of the retina—the "self-light" of the retina, as it is called.

[2] Baillarger, *Des hallucinations.*

[3] Gutsch, "Ueber Seelenstörungen in Einzelhaft," *Allg. Ztschrft. f. Psych.*, xix.; compare Köppe, *loc. cit.*, p. 49; F. Siemens, *Berl. Klin. Wochenschr.*, xx. 9 (1883).

cinated sense is found to be lowered,[1] which practically amounts to the same thing.

Various Kinds of Dissociation.—It has been already indicated (compare pp. 73, 74) that dissociation varies in kind or degree according to the nature of the cerebral change; thus it may be large or small element-groups that are split off, or, on the other hand, are in a state of heightened irritability; or again, the whole cerebral mechanism may be involved in the disturbance.

The effect of this difference will naturally show itself in the sensory delusions. From the scheme given in the preceding chapter this can easily be applied in individual cases. A more detailed exposition, however, would lead us too far, and I therefore turn at once to the effect of dissociation on our perception of the stimuli which reach us while it is present.

The Action of the Dissociative State.—The action of dissociation on the impressions received from the so-called external world has already been described; it causes excitations which normally produce "correct" or objective sensory perceptions to be misinterpreted. But it also plays a very important part through its action on the impressions which arise within the physical organism itself. These form so large and so constant a factor in our experience, and are so closely knit up together, that the elements concerned in them discharge into each other with great ease, and the resulting state of consciousness is dim and undefined. But should a particular element from any cause be released from this compact system, its irradiation becomes impeded, in the same way that the irradiation of quite new and unfamiliar stimuli

[1] Sinogowitz, *Die Geistesstörung* (1843), p. 297.

is impeded by the absence of well-worn connecting paths. Either it is completely blocked, or else it is rendered slow and difficult; and our consciousness of the resulting physiological or pathological irritation becomes proportionately intense—hence singing in the ears, ocular spectra, and other "elementary sensations."[1] If, on the other hand, a practicable path can be found the irradiation will stream through it to new groups, and thus become the cause of sensory delusions.

In mental alienation, for instance, the co-operation of a stimulus with the predisposing state is expressed in various ways. Thus in many such cases only subjective phenomena are remarked at first, and not until a later stage do apparitions or voices make their appearance.[2] In the same way isolated hallucinations sometimes begin with subjective phenomena and then, as Müller[3] has shown, are presently replaced by the sight of a *phantasma*.[4] But the need for a specific psychical state to prepare the way if a given stimulus is to result in hallucination is best shown when the

[1] No doubt hypochondriacal preoccupation with bodily processes often admits of this simple explanation.

[2] Compare Köppe, "Gehorsstörungen und Psychosen," *Allg. Zeitschr. f. Psych.*, xiv.

[3] J. Müller, *Phantast. Gesichtsersch.*, §§ 34-41. By the word *phantasma* he understands subjective phenomena of sight and hearing—*e.g.*, visions of buildings, plants, etc.—which arise suddenly, and unconnected with specks of light, in the completely dark visual field, in contradistinction to appearances which are gradually elaborated to complicated forms, the original speck of light in the eye remaining all the while to serve as a *point de repère* for the hallucinatory images.

[4] Bottex, *Sur les hallucinations;* Ruf, *Delirien*, p. 7; Morel, *Traité des maladies mentales*, p. 318; Baillarger, *Des hallucinations;* Max Simon, *Lyon médical*, xxxi. p. 439; especially in the abuse of quinine, ringing in the ears and undue sensitiveness to light occur first, and only later auditory delusions, less often visual images.

stimulus has been acting for some time, and only subjective sensations have been present, until after an emotional crisis, or some such disturbance, hallucinations supervene. Graefe[1] gives a case in point where vivid (subjective) fiery spheres seen by a patient with *phthisis bulbi* were transformed into full-fledged visual hallucinations after emotional disturbance. Similarly in the case of a lad, mentally sound, but with a perforation of the left ear, the result of a blow, typhus led to the development of hallucinations.[2] The sensory deceptions which occur after eye-operations (especially after the operation for cataract) belong to the same class. During the treatment in the dark room hallucinations are often observed in the patient.[3] It is true they are generally described as delusions of delirium, although they appear without any change of pulse or temperature taking place. A special mental state may be presumed in these cases also, for we have to take into account not only the stimulation of the external organ, but the inanition resulting from a strict regimen (a certain proportion of the cases reported relate to inebriates), and also the fact that the patient's thoughts would naturally be fixed on

[1] Graefe, *loc. cit.*

[2] *Neurol. Centralblatt*, 1882; compare *Centralblatt f. Nervenheilkunde, etc.*, N. F. v. p. 57, f.

[3] Tavignot, *Gaz. d. Hôp.* (1846); Heyfelder, "Ueber das Delirium nervosum nach Operationen und Verwundungen," *Arch. f. phys. Heilk.*, x. 3 (1851); Griesinger, *op. cit.*, p. 89, Anm.; Sichel, "Sur une espèce du délire sénil," *Union med.* (1863), No. 1; Zehender, *Klin. Monatsblätt. f. Augenheilk.* (1863), p. 123; Lange, *Gaz. d. Hôp.* (1863), No. 57; Magne, *Bullet. d. thér.*, lxiv. (1863); Graefe and Saemisch, *Handbuch d. des. Augenheilk.*, Part iii., p. 309; Schmidt-Rimpler, *Arch. f. Psych.* (1879), ix. p. 233; Jolly, "Ueber Gesichtsersch. in Folge von Verbrenn. d. Augen," *Allg. Zeitschr. f. Psych.*, xl.; Stanisl. Bielski, *Ueber Halluc. im Gebiete d. Gesichtsinnes* (1884).

the results expected from the grave operation he had just undergone. Indeed, mental disturbance has not infrequently been observed after eye-operations.[1]

It is to be remarked further that Köppe[2] found in cases of ear-disease among the insane, and where both conditions were therefore present, that auditory illusions and hallucinations invariably accompanied the subjective sounds, but failed to appear when one of the conditions was wanting. Thus the hallucinations may gradually disappear under purely local treatment of the local ailment, or they may cease when the patient's mental health improves, though the subjective images and sounds still persist.[3]

[1] Bartisch noted nervous disturbance, and Dupuytren, *Clin. chir.*, i. 55 (1832), has also described such results; Locher-Zwingli in Zürich operated on a woman, who became insane (1834); G. Sous operated on a man, who became insane and sank from inanition (1864); compare Frankl-Hochwart, *Jahrb. f. Psych.*, ix. 1, 2, (1889); Anton Elschnig, *Wiener med. Blätter*, xi. 31 (1888); E. Mendel, "Das Delir. Hallucin.," *Berl. Klin. Wochenschr.* (1894), No. 29. On the other hand, R. Fabian, *Ein Fall von Psychose nach Augenverletzung* (Dissert. 1893), attributes his case of epileptoid paroxysms of excitement to the strain and irritation of the iris, which because of its attachment to the cornea was hampered in its function whenever called upon to do extra work.

[2] Köppe, *loc. cit.*

[3] Graefe, *Berl. Klin. Zeitschr.* (1867); Flemming in his review of Hagen's "Sinnestäuschungen," *Schmidt's Jahrbücher*, xvi. p. 364; Hagen, "Zur Theorie," etc., *Allg. Zeitschr. f. Psych.*, xxv. p. 58; Fischer, "Ueber den Einfl. des galvan. Stroms auf Gehörshall.," *Arch. f. Psych.*, ix., observed in an insane patient with auditory hallucinations, not only the auditory hallucinations but also the subjective noises disappear under the influence of the galvanic current; compare Fr. Fischer, "Ueber einige Veränderungen, welche Gehörshall. unter dem Einfl. des galv. Stroms erleiden," *Arch. f. Psych.*, xviii.; Erlenmeyer, *Bericht über die Heilanstalt f. Nervenkranke* (1877); Hedinger, *Krankenbericht*, etc., Stuttgart, 1880, obtained favourable results from the constant current in many subjective noises, and also in hallucinations, to which, however, he ascribes a central origin.

Busch[1] observed that during galvanic treatment an auditory hallucination which was normally audible only on the left was strengthened on that side by the anode, and was rendered audible to the right ear as well, while the cathode abolished the auditory disturbance on the right and at least weakened it on the left. Chvosteck's[2] attempts to produce auditory hallucinations through the electric current yielded not merely elementary noises, but even complicated phenomena; these last, however, occurred only when the patient had experienced spontaneous hallucinations quite recently—*i.e.*, only when the indispensable condition favourable to the appearance of fallacious perception still obtained.

The Stimuli.—This discussion has now led us to the second factor which co-operates in the production of fallacious perception, namely, the stimulus which starts it, and which may consist firstly in any of those objective sensory impressions which we have already considered in treating of the dream state. The dependence of hallucinations on external stimuli is well illustrated in the following often-quoted communication from a patient:—

"Every tree which I approach, even in windless weather, seems to whisper and utter words and sentences. . . . The carts and carriages rattle and sound in a mysterious way and creak out anecdotes. . . . The swine grunt names and stories, and exclaim in surprise. The voices of the dogs, cocks, and hens seem to scold and reproach me, and even the geese cackle quotations."[3]

[1] Busch, "Ein Fall von acuter primärer Verrücktheit," *Arch. f. Psych.*, xi.

[2] Chvosteck, "Beiträge zur Theorie d. Hallucinationen," *Jahrb. f. Psych.*, xi. 3.

[3] *Allg. Ztschrft. f. Psych.*, xxxv. p. 696.

To this class belong also hallucinations occurring in clouding of the cornea or lens. Perhaps the case quoted by Griesinger of the man who always saw a black goat at his side may be taken as an example. In the same way eyelashes, tears, and such-like, may furnish the material for hallucinations. This is specially likely to occur, as has been often insisted, if there is any want of distinctness in the original impression. Myopia and other defects of vision which cause the sense-impression to be indistinct also predispose to fallacious perception. Zander reports that among 100 mental cases he had 8 colour-blind patients, who all suffered from visual delusions; and Leubuscher's[1] account of the patient who mistook himself for his mistress seems to point to the same explanation, for if he saw himself in a mirror he knew the face to be his own, but if he only saw his reflection dimly in the window-pane he took it for the image of his lady.

The stimulus need not, however, be an objective sensory impression; it may consist in pathological or physiological irritation of the sensory centres. In the normal state both processes, as we see, are recognised as so-called subjective sensations; but if dissociation obtains, they may become causes of false perception.

The physiological sensory irritation may depend on changes such as metabolic processes in the centres themselves, and in the nerve tracts leading to them. The pathological irritation may depend on morbid processes, such as meningitis, which radiate from neighbouring parts of the brain; at least the cases

[1] *Op. cit.*

of sensory delusion in which external impressions fail to be perceived, either owing to peripheral disturbance or because the ascending current is broken off at some intermediate point, are most easily explained by supposing an irradiation proceeding from the morbid part. Or, secondly, the pathological irritation may act from some given point in the course of the sensory path concerned; for instance, in a partly-atrophied nerve the seat of the excitation would be the point of transition from the morbid to the sound parts. Such cases might plausibly be explained by adopting H. E. Richter's view of hallucination as an instance of anomalous functioning of the sensorial nervous system analogous to anæsthesia dolorosa, in which, though the peripheral stimulus cannot reach the central organ owing to the irritation of the sensory nerve at some intermediate point, the brain nevertheless receives impressions from the seat of the irritation. We are reminded in this connection of the unilateral hallucinations occurring in the prodromal stage of hysteria, of fallacious perceptions in enfeebled visual power (*neuritis opt.*), and of the fact observed by Politzer[1] that many patients cannot hear objective sounds which resemble the illusory sounds from which they are suffering.

Post-mortem Reports.—It should be noted that the brain autopsies on persons subject to hallucinations

[1] Politzer, "Über subjective Gehörs-Empfindung," *Wiener med. Wochenschrift* (1865), No. 94. "Thus many patients who are haunted by a subjective sound similar to the ticking of a watch report that they cannot tell by listening whether they really hear the ticking of a watch held to their ear." Hoppe, however, refers this to the difficulty commonly experienced in distinguishing between two allied sounds.

show very diverse results. Cases are known in which hallucinations occurred notwithstanding complete loss of the organ and atrophy of the optic nerves.[1] Thus Clouston found in visual hallucinations degeneration of the optic nerve extending to the corpora quadrigemina, and Schüle cites a case in which there was softening of the entire thalamus as far as the root of the corona radiata. Changes in the basal ganglia are very frequently found.[2] Nevertheless even Luys,[3] who would locate the process of hallucination in the optic thalami, admits that the disturbance frequently extends to the cortex. W. J. Mickle[4] reports as the result of a great number of necropsies that in cases of hallucination "thalamic disease plays a less important part than cortical." Still he found no connection between the morbid parts and Ferrier's centres. On the other hand, he found the latter affected without

[1] J. Müller, *Phant. Erscheinungen*, 31-34; Michéa reports cases of Marc. Donatus; Calmeil describes a case of his own; Foville; Johnson, *Med. chir.*, 220 (1836); Romberg, *Nervenkrankheiten*, 3rd ed., p. 133; Bergmann, *Göttinger Naturforscher-Vers.* (1854), *Psych. Corresp.*, Bl. i. No. 8, Beil.; *Bericht aus der Wiener Irren-Anst.* (1858); Forel, *Der Hypnotismus* (2nd ed.), p. 55; Stenger, "Die cerebralen Sehstörungen der Paralytiker," *Arch. f. Psych.*, xiv. (in total amaurosis and after paralytic attacks); Meschede, *Allg. Ztschrft. f. Psych.*, xxxiv. (auditory hallucinations with localised degeneration of the acustici).

[2] For instance, Flechsig (*Neurol. Centrlbl.*, ix. 4) found in a case of marked auditory hallucinations the externally normal inferior corp. quad. impregnated in its outermost stratum, and partially in its inner one, with calcareous concretions.

[3] *Gaz. d. Hôp.* (1880, Dec.), p. 46.

[4] *Journ. of Ment. Science* (1881, Oct.), p. 382; Reinhard, "Hirn-localisation," *Arch. f. Psych.*, xvii. and xviii., found hallucinations three times in sixteen cases of lesions of the occipital lobes, and certainly in one case photopsia.

any indication of hallucination,[1] just as hallucinations have been observed where no corresponding changes in these parts could be discovered.[2] Sander has noted that while in ordinary paralytic cases the changes are generally spread for the most part over the frontal lobes, when the paralysis is accompanied by hallucinations numerous and marked alterations are found in the otherwise little affected parts behind the posterior central convolution.[3] He also observed disappearance of the white matter of the occipital lobes and dilatation, principally of the posterior horn of the lateral ventricle. He justly remarks, however, that the changes found in the necropsy ought not to be used directly to explain hallucinations appearing often long before death. The hallucinations belong not to the time of the destruction of the neural elements, but to the period of irritation, whether this arises from neighbouring morbid cells or from the processes preceding destruction of the cortical cells themselves—that is to say, they belong to the earlier period of delicate molecular changes, rather than to the later stage of grosser and more obvious disturbance. There is no lack of cases to show this. According to Fr. Paterson,[4] hemioptic hallucinations were observed by Séguin immediately before the appearance of hemiopia. Vetter reports a similar case.[5]

[1] *Journ. of Ment. Science*, p. 381; *ibid.* (1882, Jan.), p. 29.

[2] Sander, *loc. cit.*, pp. 334, 335.

[3] Mendel, "Ueber den jitzigen Stand," etc., *Berl. Klin. Wchschr.* (1890), confirms these results from his own experience.

[4] Paterson, "The Homonymous Hemiopic Hallucination," reprinted from the *New York Med. Journal.*

[5] Compare Tigges, "Zur Theorie der Hallucin.," *Allg. Zeitschr. f. Psych.*, xlviii., vol. iv. "Vetter communicates a case of hemianopsia sinistra bil. (in normal eye-practice) associated with visual hallucin-

H. Lehert[1] states that hyperæsthesia of the sensory nerves occurs shortly before the power of feeling is lost altogether, as a result of tumours within the skull, and P. Briquet refers to the same fact in his work (1853) on Peruvian bark and its preparations. Edinger had a patient, suffering from softening of both the posterior lobes, who saw a hallucinatory light-phenomenon just before he became blind.[2] Winslow[3] noted that just as the approach of mental disturbance is often indicated by morbid increase of physical as well as psychical sensibility, so apoplexies are preceded by hyperæsthesia, especially of the optic nerve, and by visual hallucinations (deuteroscopia). He also observed that oppressive and frightful dreams preceded, with marked regularity, tuberculous meningitis, and also first attacks of epilepsy; he noted, moreover, the occurrence of hallucinations in the state between sleep and waking long before the development of general paresis accompanied by insanity. From these facts he concluded that there are morbid processes at work in the brain long before the actual event. A. Tamburini, who sees in hallucination the product of a state of irritability of the affected

ations which continued to appear obstinately on the left, on the blind part of the visual field . . . he explains the hemianopsia by a tumour in the white substance of the left posterior lobe, and the hallucinations which occurred, although the cortex was cut off from the basal ganglia, by a state of irritability in the cortex of this lobe." Further cases reported by Henschen, Pick, Hammond, Sepilli, and others are quoted by Tigges. See also Paterson, *op. cit.*, and the *Neurolog. Centralbl.* (1892), No. 11.

[1] Lehert, "Ueber Krebs und die mit Krebs verwechselten Geschwülste im Gehirn u. seinen Höhlen," *V. & R.'s Arch.*, iii. 3 (1851).

[2] Winslow, *On Obscure Diseases of the Brain*, etc. (1860).

[3] Compare Schirmer, *Subj. Lecht. Emphind. bei total, Verl. d. Schvermög* (Diss. Marburg, 1895).

cortical centre,[1] also considers that the affection may be irritative, and quotes cases from Ferrier, Pooley, Atkins, and Gowers, in which the changes of the corresponding cortical centres caused more or less complete loss of visual power. During the period of irritation, however, pronounced visual hallucinations were observed in these patients.[2]

Excitations of the Visual Sense.—Let us begin our study of the so-called subjective sensations with those affecting the sense of sight. Attention was early drawn to the physiological phenomena of this class. Every one can observe in his own experience the "light chaos" or "light dust," as the singular dis-

[1] Tamburini, *Riv. sperim. di freniatria e di med. leg.*, vi. 1 e 2 freniatria, p. 126 (1880).

[2] Compare Tamburini in *Rev. scientifique*, xxviii. p. 141; and also the interesting case in the *Neurol. Centralbl.* (1889). A woman with acute *paranoia hallucinatoria*, besides suffering from bilateral auditory hallucinations, was also subject to distinct left-sided ones; these disappeared, and a stable visual hallucination (on the left side) of a "white dog leaping up" appeared, but was recognised by the patient as morbid and subjective. The visual power was not diminished. Renewal of epileptic attacks, from which the patient had suffered before the visual hallucinations disappeared; fatal termination. Autopsy showed that in those parts where the membranes had become adherent to the cortex, connective tissue had developed at the expense of the nerve cells. In some preparations the cells were shown to have entirely disappeared (between the first temporosphenoidal and third fourth of the upper central convolution, all on the right side). The case is explained by assuming that irritative processes were set up in the affected parts of the cortex, which caused both the epileptic attacks and the unilateral hallucinations. With the destruction in the neural elements of the right hemisphere, through the development of connective tissue, the sensory phenomena of irritation disappeared. Similar descriptions are given by Gurney, "Hallucinations," *Proceedings of the S.P.R.* (1885); Tigges, "Zur Theorie der Hall.," *Allg. Zeitschr. f. Psych.*, xlviii. p. 311; Luys, *Gaz. des Hôp.* (1881), p. 276; Despine, *Ann. méd. psych.*, 6 ser., vi. p. 375; Devay, *Gaz. d. Paris* (1851); Curtis, *Lancet*, ii. No. 24 (1841).

turbance is called which occurs in the visual field in an absolutely dark room. Filehne,[1] relying on self-observations in chronic nicotin poisoning, has tried to prove that these appearances must be regarded as central in their origin, that is, as arising in the visual centres even behind the region affected by the nicotin. Generalising from these observations, he extends his hypothesis to after-images and to the sudden darkening of the visual field produced by prolonged gazing at a given point (*Starrblindheit*). It is to be remarked that the feebler the light the sooner the effect is produced (although it occurs more rapidly in sunlight than in diffused daylight). During this after-blindness the "light chaos" is to be observed just as in an absolutely dark room, and while it still persists, if an object, the hand for instance, is brought into the line of vision, and is then at once withdrawn, a dark after-image, surrounded by a bright corona, will appear in the place which it momentarily occupied. The dark after-image disappears by degrees with the gradual fading of the "light dust."

Purkinje has described black tree-like forms, which appeared when he had gazed at a light at a distance of six inches from the eye, and Sauvage saw the same when gazing at a brightly lighted wall. Müller explains the distinctness of these branching forms by supposing that the retina perceives itself. Newton, Eichel, and Elliot observed fiery rings, and Krieger[2] seeks to refer these, as well as the pressure-phenomena, and indeed all phenomena lying outside the axis of

[1] Filehne, "Über die Entstehung des Lichtstaubs, der Starrblindheit und der Nachbilder," *Arch. f. Ophthalm.*, xxxi. 2, pp. 1-30.

[2] Krieger, "Ueber Licht und Farben-Sehen," *Deutsch. Klin.* (1850), pp. 50-52.

vision, to processes taking place within the compass of the optic nerve. Others, again, hold that all colour images have their origin in the retina; Graefe[1] saw such disappear after enucleation of the eyeball, and after division of the optic nerve.

The pressure images, most simply induced by turning and gently pressing the eyeball towards the nose, are familiar phenomena. There are also the flying sparks which are seen during electric stimulation of the eye,[2] as shown by Volta, and the sparks which follow from a violent blow on the forehead, etc. These last played a part in a criminal trial in the early part of this century. The plaintiff, who had been the victim of an assault in the dark, maintained that he recognised his assailant by the light of the sparks which flashed out of his own eyes when he received the blow! An "expert" who was consulted upon the point admitted the possibility of the plaintiff's assertion.

Hoppe, in particular, has devoted himself to the study of these entoptic phenomena, and has given a detailed account of them. He endeavours to class all visual hallucinations under this category.[3]

"Hallucinations, unreal perceptions due to a misinterpretation of sensations received from the mere excitation of the nerves conveying sensory impressions, require some material basis; this is furnished by the very excitation of the sensory nerve, and the nature, condition, and product of this excitation. For

[1] Graefe, *Berl. Klin. Wochenschr.*, iv. 31 (1867).

[2] We may note here that Ferrier seeks to refer the eye-movements of animals, observed in electrical stimulation of the respective cortical regions, to such subjective light-sensations.

[3] J. Hoppe, "Der entoptische Inhalt des Auges und das entoptische Sehen," etc., *Allg. Zeitschr. f. Psych.* (1887); *Erklärung der Sinnestäuschungen*, etc. (4th edit., 1888).

instance, a feeling of weight and pressure experienced in falling asleep may become the tactile hallucination of a cigar held between the fingers; this feeling between the fingers is not a mere feeling of pressure, however, but the 'persisting after-image' of a cigar held between the fingers. These after-images, which differ from the phenomena usually so called only in that their origin is not remembered,[1] are most easily explained, if we discard the unphysiological assumption of the brain interfering centrifugally with the sensory paths by postulating a peripheral sense-memory. They are to be regarded, especially when dealing with the visual sense, as 'explosion products' or metabolic products of the retina connected with its functional activity, if not as secretions, then as excretions. They are, so to speak, material images which arise, now suddenly, now gradually, move onwards and disappear, and which also may be influenced by movements of the eye."[2] They possess the power of "covering" other objects; but often, when they are thin flakes, they are transparent. They appear in four forms, as brightness, darkness, colour, and light. The most powerful cause of entoptic phenomena is the yellow spot, the *macula lutea* itself; besides which the pupil and the blood-vessels play a part, chiefly as bearers of the colour-cloud surrounding them; moreover, the pulse of the central artery of the retina influences the movement as well as the sensory nerves of the muscles (muscular sense, etc.), the motor nerves, and the muscles themselves, "for the act of vision is nothing else but a grasping with the muscles of the eye."

[1] See the report of C. M. Bakewell, *Proceed. of the S.P.R.*, vol. viii. pp. 450 *et seq.* His experiment consists in gazing fixedly at an object, and then putting out the light and shutting his eyes at the same moment. If the eyes are kept closed till sleep supervenes, and immediately on waking are directed to the white ceiling illuminated by the morning light, and at once closed again, a belated after-image is often called up of the object upon which the eyes were fixed before falling asleep. The fact that it is not always the after-image of the particular object selected for the experiment which appears, but sometimes that of some brightly lighted object seen shortly before, seems to preclude the possibility of explaining the phenomena as due to a state of expectancy. The experiment has been confirmed by several other observers. Compare below, p. 173, Note 1.

[2] Compare the account, *Münch. Samml.*, xvi. 2, 6 (Appendix I.).

This hallucination-matter, which is either hallucination itself or the raw material of hallucination, must, as it is something physical, occupy some place, and this place is assigned to it in the retina itself. Whether regarded as the material basis of hallucination or as hallucination itself, it is, whether the eyes are open or closed, located in the external world, and the hallucinatory object is referred to a greater or less distance according to the accommodation of the eye, and will appear larger if the imaginary distance is greater. A few examples will perhaps best illustrate the part played by the various factors in hallucination.

Examples: "Suddenly in the region of the pupil a well-formed but very dull yellow face appeared; it was a luminous disc out of the *macula lutea*, with a few dark streaks from which I formed the face. This dull yellow face, seen just at the beginning of [entoptic] vision (before falling asleep at half-past ten o'clock), indicates an over-excited state of the retina—perhaps the result of using a petroleum reading-lamp with a large burner." . . . "Thereupon I saw two persons clad in black in a very dark visual field. The one looked about him inquisitively, the other nodded (flashes of light)." . . . "Then wherever I looked I saw a window (glass-like shimmer from the *mac. lutea*)." . . . "I could see the saw quite plainly. It worked opposite me, moving regularly backwards and forwards. I could see no one sawing, but at the further side a confused, dark mass and a shadowy hand. The saw worked across a black plank which lay upon a sawing-jack, and appeared before me as though 'sprung out of nothing'; nevertheless, it was only a sketch improvised from material provided at the moment. The visual field was fairly light, many long light rays streamed from my eyes and fell somewhat obliquely on the opaque black masses, and the saw itself was a shining compact sheaf of highly luminous rays, moved by the pulse beat, with a corresponding movement on the part of the muscles of the eye, by which the impression of moving figures is ordinarily conveyed. Then the saw and the rest of the light rays disappeared, but the sawing still continued; for though the pulse movement was lost, the eye muscles still kept up the sawing motion, and I convinced myself of it and stopped their movement. Nothing then remained of the vision but a dark patch upon which changing lines of light appeared."

Although the attempt to refer all visual delusions to such persistent after-images may be carried too far, their importance, for instance, in the dream-state, and in the hallucinations of hypnosis and similar states, is not insignificant. They are generally overlooked in the waking state, because the attention of the sensory faculties is preoccupied with the external environment; and yet William James is of opinion that we shall probably never be in a position fully to appreciate the importance of the part played by these after-images in the drama of our waking thought.[1] How much more then may their importance increase when the interest in objective sensory impressions flags, or when their path to the sensorium is blocked?

Morbid processes, equally with the physiological subjective impressions which we have hitherto been considering, may be the exciting cause of hallucination. The zigzag figure of migraine is a familiar instance. Scholz[2] refers the visual hallucinations in

[1] W. James, *op. cit.*, ii. pp. 83 *et seq.* "Many years ago, after reading Maury's book, *Le Sommeil et les Rêves*, I began for the first time to observe those ideas which faintly flit through the mind at all times, words, visions, etc., disconnected with the main stream of thought, but discernible to an attention on the watch for them. A horse's head, a coil of rope, an anchor, are, for example, ideas which have come to me unsolicited whilst I have been writing these latter lines. They can often be explained by subtle links of association, often not at all. But I have not a few times been surprised, after noting some such idea, to find on shutting my eyes an after-image left on the retina by some bright or dark object recently looked at, and which had evidently suggested the idea. 'Evidently,' I say, because the general shape, size, and position of the object thought of and of after-image were the same, although the idea had details which the retinal image lacked." To entoptic processes are also to be referred those dream-images which persist for a time in the waking state until external stimuli enforce their prior claim to attention.

[2] Scholz, *Berl. Klin. Wchschr.*, xiii. (1876).

a case of mania associated with Bright's disease to changes in the retina produced by the kidney affection, and to the resulting entoptic phenomena. Savage[1] reports two cases of visual delusions in optic neuritis, which resulted in the one case (contracted kidney) in weakening of the visual power, and in the other (due to syphilis) in entire loss of vision. Uhthoff's[2] researches tend in the same direction, and point to optic neuritis as a condition favourable to fallacious perception in delirium tremens.[3] Graefe observed subjective light sensations in phthisis bulbi.[4] Sinogowitz[5] cites a case of Bright's[6] where the patient suffered from visual hallucinations after apoplectic attacks, and where, in the post-mortem examination, a tumour half an inch in diameter and reaching to the surface, was discovered in the inferior corpus geniculatum.

A pathological state of the sensory nerve tracts has often been found associated with hallucinations, and especially with *unilateral* hallucinations, and in many cases these have ceased when the local lesion[7] has

[1] G. H. Savage, *Journ. of Ment. Science*, xxvi. p. 245 (July 1880).

[2] Uhthoff, "Untersuchungen über den Einfluss des chron. Alkoholismus auf das menschl. Seh-Organ," *Arch. f. Ophthalm.*, xxii., xxiii.

[3] Compare above, p. 42, Note 3.

[4] Graefe, *Berl. Klin. Wochenschr.*, iv. 31 (1867).

[5] Sinogowitz, *op. cit.*, p. 257.

[6] *Guy's Hosp. Rep.* (1837).

[7] H. Higier cites, among others, a case of Buch's (*Arch. f. Psych.*, 1881) with auditory hallucinations of the left ear, which disappeared after the cure of otitis media of the same side; a case of Ball's with inflammation of the middle ear and purulent discharge, where local treatment not only cured the physical ailment but also banished the unilateral hallucinations which had gradually become established; a case of Mabille's (*Ann. méd. psych.*, 1883), where unilateral auditory hallucinations (on the right) ceased on the removal of a sprouting grain of corn imbedded in the wax of the ear. Local excitation is also indicated in a case of Raggi's, quoted in the *Neurol. Centralbl.*, 1884,

been cured. Such unilateral excitations, however, are not necessarily expressed by a unilateral hallucination. Both eyes may share in the vision, just as the green after-image which follows from prolonged gazing with one eye at a red cross is not necessarily seen only by the one eye in subsequent binocular vision, and may even, when the eye used in looking at the cross is closed, appear in the visual field of the other eye.[1]

p. 41. See also Fürer, "Ueber d. Zustandekemmen von Gehörstäuschungen," *Centralbl. f. Nervenhltende*, N. F., v. (Febr.); Krafft-Ebing, "Sinnesdelirien," p. 25; Souchon, "Ueber einseitige Hallucinationen" (*Dissert. Berlin*, 1890); Régis, *l'Encéphale* (1881), p. 46; M. Voisin, *Bullet. d. Thérap.*, xxxix.; Despine, *Psychologie Naturelle*, ii. p. 29. Magnan (*Arch. de Neurologie*, 1883, p. 18) communicates three cases of double unilateral hallucinations, all occurring in paranoia patients.

[1] Béclard, *Traité élémentaire de Physiologie;* Binet, *Psychologie du Raisonnement*, p. 45; Delabarre, *Amer. Journ. of Psychol.*, ii. p. 326; Baillarger, *Mémoire*, etc., p. 460; compare Herth, *Kunstphysiol.*, ii. pp. 464 *et seq.* In the "Report" the fact which we have touched on above in the text is mentioned in connection with the experiments published by Mr. John Gorham in *Brain* (1881-82, vol. iv.), which have nothing to do with what we are considering here; for we are concerned with an after-image which, arising in one eye through monocular stimulation, seems to belong to the unexhausted eye (through which all other visual impressions are then received), because of the latter's activity, and because the attention is directed to it; while Gorham is occupied in showing that in monocular excitation simultaneous contrast colours are produced in the other eye. There are, however, two cases of unilateral hallucinations reported by Féré which may perhaps be brought into line with the foregoing fact, if it is assumed that the concentration of attention on one-half of the body may cause a hallucination to be unilateral. In one of these cases unilateral visual hallucinations appeared in connection with violent facial neuralgia accompanied by *herpes zoster*, and in the other unilateral auditory hallucinations were associated with severe neuralgia of the trigeminus. Thus it might be supposed that the neuralgia first prepared the way for the hallucinatory state, and then influenced the localisation of the sensory delusions.

Excitations of the Auditory Sense.—In the auditory sense after-images, or rather after-impressions, are not often observed. Perhaps the prolonged buzzing which follows a loud report may be reckoned as such, and also the persistence with which the airs of certain songs and waltzes, etc., haunt the ear, but these phenomena are not really analogous to retinal after-images. For example, when we are haunted by a certain tune, especially if it has been started in the first instance by a real auditory sensation, it is perhaps a mere perception of objective sounds influenced by the persistent feeling of rhythm. On the other hand, the following experience of Preyer's[1] is to be reckoned as a real after-impression. After he had been listening to one musical note for a considerable time a loud plashing sound supervened and continued for some minutes.[2]

Inadequate stimuli are a frequent cause of auditory sensations. The sound experienced if a finger is put into the ear,[3] or if one rests the ear on the hand or lies upon it, are familiar instances; and A. Fick has drawn attention to the noise which is caused by an involuntary movement of the tensor tympani following on the contraction of the masticatory muscles when the lower is pressed against the upper jaw.[4] The experimentally induced excitation of the auditory sense through galvanism may perhaps also be

[1] Preyer, "Über die Grenzen der Tonwahrnehmung," *Physiol. Abhndl.* (Jena, 1876).

[2] Compare P. Jacobs, *De auditu fallaci* (Diss. Bonn, 1832).

[3] Compare Helmholtz, *Verhndlg. d. Natur-histor. Ver. z. Heidelb.*, v. pp. 153, 161.

[4] F. Fuchs also recalls this in his article in the *Neuro. Centralbl.*, xii. 22, "Über einen Fall. von subjectiven Gehörs u. Gesichtsempfindungen; Selbstbeobachtung."

mentioned.[1] The structure of the organ is, however, so complicated, and so little is known of what part the stimulation actually affects, that it is hard to say whether we are really here concerned with subjective sounds corresponding to the sounds directly produced when the auditory nerve is called into play. Hoppe draws attention to the "clang"-producing action of the outer ear, and it is possible that this muscle may have played a part in such experiments through feeble vibrations hardly possible to exclude. Syzianko[2] seeks to refer the sounds to the muscular contractions occurring under galvanism, and to the bubbles which are formed during galvanic action by the decomposition of water. Perhaps, also, sounds which are not normally noted are of importance, such as the resonance tone of the middle ear, which, according to Kieselbach,[3] is always present, but just because of its continued resounding is not consciously perceived except when the nerve is specially excited, for instance, through electric stimulation, or when from internal causes it is placed in a state of hyperæsthesia. Internal causes of this kind appear to be indicated in the cases of mental disease with auditory hallucinations investigated by Jolly.[4] It should be added, however, that Meynert[5] is

[1] Brenner, *Arch. f. pathol. Anat.*, xxviii. 1, 2; Schwartze, *Troeltsch Arch.*, i. 144; Jolly, *Arch. f. Psych.*, iv.; Buccola, *Rivist. di freniatria sperimentale*, xi. (1885).

[2] Syzianko at the seventh Congr. d. russ. Naturforsch u. Arzti., Odessa (1883).

[3] Kieselbach, "Ueber d. Galvanische Reizung d. Acusticus," *Arch. f. Physiol.* (1883); Dessoir, *Arch. f. Anat. u. Phys.* (*Phys. Abth.*), 1892, pp. 204-210.

[4] Jolly, *Arch. f. Psych.*, iv.

[5] Meynert, *Wien. med. Blätter* (1878), No. 9.

convinced that these hallucinations have a different origin.

According to Ehrhard,[1] subjective auditory sensations occur (1) as pulsations; these, however, are not, strictly speaking, "auditory," but organic sensations, for they depend on a heightened perception of the pulse-beat of the internal carotid artery, and may be modified by pressure on the carotid or by the action of digitalis; moreover, they are to be observed in deaf mutes, where stimulation of the acoustic nerve is excluded; (2) from stimulation of the ramus vestibuli in catarrhs, abscesses, etc.,[2] as sensations of noises (hummings, rushings, and buzzings); (3) from stimulation of the ramus cochleæ,[3] as sensations of "clangs" (musical tones, singing, etc.); and (4) as a combination of (2) and (3) from stimulation of both branches of the acoustic nerve.[4] Lucae[5] does not think that definite auditory hallucinations should be referred to definite affections, and classifies them according as they are heightened or diminished by external sounds.[6]

[1] Ehrhard, *Berl. Klin. Wochenschr.* (1867), No. 12.

[2] Plater and Mercurialis report cases in which these pulsations could be perceived as objective sounds by persons near the patient.

[3] Compare Moos, "Ueber das subjective Hören wirklicher musikalische Töne," *Virch. Arch.*, ix., Band 3, Folg.; Czerny, *ibid.*, Bd. xi.; Schwartze, "Ueber subject. Gehörsempfindung," *Berl. Klin. Wochenschr.* (1886).

[4] For a different classification see Itard, *Traité des maladies de l'oreille et de l'audition.*

[5] Lucae, *Zur Entstehung und Behandlung d. subject. Gehörsempfindungen.*

[6] A patient of Urbantschitsch's, to quote an example, experienced an increase of the subjective sounds when he heard street noises, carts passing, and so on. Again, it has sometimes been noted that the auditory hallucinations only occur when faint objective sounds are

In any case, even leaving out of account the cases where the sounds are supplied by the physical organism itself,[1] a morbid affection of the peripheral organ is not always necessary for the production of hallucinatory sounds. Their occurrence in many railway servants, for instance, is to be referred to subtler central disturbance.[2] Of course what has been said above, in treating of subjective visual sensations, as to the irradiation of pathological stimuli, holds good for the auditory as well as for other senses.

Excitations of the Olfactory Sense.—That olfactory sensations may be induced by inadequate stimuli has not been absolutely demonstrated,[3] but there is no reason to doubt such a possibility. Cases of sub-

heard. Compare Ziehen, *Psychiatrie*, pp. 25 *et seq.* Lucae reports, on the other hand, that treatment by means of sounds (produced by tuning forks or other means) frequently results in a weakening or extinction of the subjective sounds.

[1] The pulsations mentioned above, the cracking sounds in yawning, in opening the Eustachian tube (Schmidekam, "Studien," *Arb. d. Kieler physiol. Instit.*), sounds resulting from phlegm stopping the air passages (Hoppe, *Erklärung der Sinnestäusch.*), and so on. Quadri (*l'Osservatore med. di Napoli*, 7 Settembre 1883) communicates a case where chronic noise in the left ear was traced to an upper tooth, which was extracted, although it appeared perfectly sound, whereupon the noises ceased. When the tooth was cut open, a small bony knob was found dangling from it which struck upon the inner wall of the tooth like the clapper of a bell, and so produced the sound.

[2] Baginsky, *Ueber Ohrenerkrankung bei Railway spine;* Pollnow and Schwabach, *Die Gehörstörungen des Lokomotivpersonals*, and others.

[3] The hypothesis maintained by Valentin, *op. cit.*, that subjective sensations of smell may be induced by pressing and suddenly letting go of the nostrils is denied by Fröhlich, "Ueber einige Modificationen des Geruchsinnes," *Sitzng.-Ber. d. Wien. Acad. Math. naturwiss. Klasse*, iv. p. 322. Galvanism applied to the nose is also said to produce sensations of smell, but possibly such sensations are more of the nature of pricklings and tinglings.

jective olfactory sensations and hallucinations in disturbances of the nerve tracts are not infrequently reported. Morel[1] mentions olfactory hallucinations in a case where an abscess was found in the *corpus callosum*. In a case of severe olfactory delusion,[2] a fungoid growth of the *dura mater*, the size of a hazel nut, was found attached to the cribriform process and surrounded by the olfactory nerves. Lockemann[3] mentions a case of vague but not disagreeable olfactory delusions. The autopsy revealed a cancerous growth only separated from the brain by masses of cellular tissue. It stretched as far as the trigonum olfactorium, and had quite destroyed the left olfactory tract; the right was untouched. Sander[4] speaks of epileptic attacks with subjective olfactory sensations, in destruction of the left olfactory tract by a tumour. Meschede[5] mentions fully-developed olfactory hallucinations in pronounced degeneration of the olfactory bulb. Emilio Carbonieri[6] found, in a case of sensory delusions of the nasal organ, a tubercular body in the brain as big as a walnut.

Excitations of the Muscular Sense.—Great importance is attributed by some authors to subjective sensations of the muscular sense. Cramer,[7] for instance, seeks to refer a multitude of phenomena to this cause.

[1] Morel, *Traité des Maladies Mentales.*
[2] *Bericht aus d. Wiener Irrenaust*, 1858, p. 266.
[3] Lockemann, *H'u. Pf's. Ztschrft. iii. Reihe*, xii. p. 340 (1861).
[4] Sander, *Arch. f. Psych.*, iv. pp. 234 *et seq.*
[5] Meschede, *Allg. Zeitschr. f. Psych.*, xxxiv. p. 261.
[6] E. Carbonieri, *Riv. clin.*, xxiv. p. 657 (1885).
[7] A. Cramer, *Die Hallucinationen im Muskelsinn bei Geisteskranken u ihre klin. Bedeutung* (1889).

The course of Cramer's argument is as follows :—According to Meynert,[1] a large part, principally indeed the anterior part, of the cortex is the seat of motor ideas derived from a centripetal sensory tract (the path of the muscle sense), which receives its impressions in the muscles, and conducts by its specific energy the sensations of movement to the cerebral cortex, where they are translated into ideas of movement and stored up as such. It is thus possible to send forth motor impulses so accurately measured (antagonistic innervation: Rieger) that the required movement is effected at once without any further correction. In this way, that is in reliance on our muscle sense, we learn our native language by acquiring conceptions of the movements accompanying all changes in the equilibrium of the parts concerned in speech; the same principle holds good for the other complicated movements of our body. How momentous then must be the hallucinatory stimulations of the muscular sense-tract through which our consciousness receives information of a movement which never took place! Such a process is fraught with most importance when it occurs in connection with (1) the group of muscles concerned in locomotion (muscles of the trunk and the extremities); (2) the muscles used in speech; (3) the group of eye muscles.

1. When a morbid process leads to stimulation of any part of the muscular sense-tract, and thus to the corresponding muscle sense-hallucination, the stimulus will, if it be strong, pass over directly to the motor tract, and evoke the realisation of the false motor idea which had intruded into the consciousness, leading in some cases to involuntary acts, and in many to involuntary movements. If, on the other hand, the stimulus be weak, it will call forth motor impulses to neutralise the imaginary wrong position or the movement which had never actually been performed, thus leading to another class of involuntary actions and some involuntary ideas.

[1] Meynert, "Beiträge z. Theorie d. maniakal. Bewegungserscheinungen," *Arch. f. Psych.*, ii. p. 639; *Psychiatrie* (1884), p. 132; compare Goltz, "Verrichtungen des Gehirns," *Arch. f. Anat. u. Physiol. von Reichert u. Dubois-Reymond* (1870); Hitzig, *Untersuchungen über das Gehirn.* Meynert is also opposed here by Munk, who connects the feeling of innervation with the subcortical ganglia.

2. We learn our native tongue as children, not only under the guidance of the ear, but also with the aid of the muscular sense; and in the same way later, when acquiring foreign languages, and especially in learning by rote, we avail ourselves more or less of the same method, articulating the words as we learn them, and thus acquiring as precise motor ideas as possible. Such motor ideas are all the more important, because thought itself may in general be considered as a kind of internal speech, although the possibility of thought without words must be admitted.[1] When thinking articulately, however, we send slight corresponding motor impulses to the parts concerned in speech, though we are usually unconscious of so doing.[2] Now supposing the whole muscular sense-tract to be in a state of unstable equilibrium, the motor impulses which issue during such thinking in words, and of which we normally remain unconscious, will be intensified as motor sensations, just as if what was only thought had been actually articulated. The patient supposes all he thinks to be accompanied by an inner voice, and often locates this voice in some part of the body where a morbid condition (*e.g.*, pressure in the pericardiac region) happens to be present, or else he connects it with objective or subjective noises (*e.g.*, with the special ear-sounds), and believes that it comes from without. When he reads he will hear the words repeated aloud after him (since the occurrence of motor ideas is always the secondary process in reading); but if he writes (in which case the ideas of speech-movements precede the ideas of writing movements, motor ideation being in this case the primary process), he seems to hear the words dictated to him (audible thinking). Secondly, if a part only of the whole centripetal tract which connects the organs of speech with the cortex is excited to hallucination, then only a particular motor idea will result, which will be connected with the corresponding auditory idea, and thus obtrude itself on the consciousness as the idea of a word (involuntary ideation). Lastly, should the stimulus be strong enough to extend into the motor region, a third phenomenon—involun-

[1] Preyer, *Die Seele des Kindes*, p. 259; Kussmaul, *Die Störung der Sprache*, p. 16; Stricher, "Die Gedankenbildung der Aphasischen," *Wien. med. Blätter*, 1878, No. 1.

[2] Stricker, *Studien über die Sprachvorstellung* (1880), pp. 29 *et seq.*

tary speaking—will be developed. With reference to Kahlbaum's explanation of involuntary speaking and the involuntary movements referred to above as "cramp," it is to be noted that co-ordinated movements can only take place under the guidance of motor ideas, whereas cramp is simply a motor phenomenon not governed by any idea; it consists merely of unco-ordinated movements, often of isolated twitchings.

3 If the motor sense is really an important factor in the formation of exact ideas of space, a hypothesis denied by Hering,[1] but maintained by other observers,[2] it is easy to see that the sensation of a movement which is not caused and accompanied by a real movement of the eye muscles in connection with the sensory images of the optic nerve, which are always present, necessarily leads to an erroneous perception of space, causing external objects which are at rest to seem in motion, and falsely representing the position and proportion of things.

There is nothing to be urged against this last point of Cramer's, but it is not easy to accept his far-fetched explanation of the origin of involuntary ideas, and his explanation of auditory hallucinations is absolutely untenable; for the motor hallucinations which he quotes could have but one of two effects on the speech apparatus: either they must be strong enough to extend into the motor region, in which case involuntary speech, or logorrhoe, ensues; or if they are feeble, the patient imagines that he articulates when he is not so doing. An auditory hallucination can never arise in this way. When the hallucinatory articulation is not associated or blended with sounds, that is to say, when the motor excitation is not accompanied by excitation of the auditory sense, so far

[1] Hering, "Der Raumsinn u. die Bewegungen des Auges," in Herrmann's *Handbuch. der Physiol.*, vol. iii., part i., p. 547.

[2] Wundt, *Grundzüge der phys. Psychol.*, ii. pp. 189 *et seq.*; Funke, *Lehrb. der Physiol.*, pp. 394 *et seq.* (6th edition, published by Grünhagen); Helmholz, *Handbuch. d. physiol. Optik.*, p. 801.

from experiencing an auditory delusion, the patient, who believes he is speaking, must imagine that he is either deaf or dumb, since he perceives his (subjective) movements of articulation, but does not hear his own voice. If excitation of the muscular sense be accompanied by subjective or objective excitation of the auditory sense, the perception can only be altered in so far that the patient then seems to hear himself speaking with his normal voice, or in strange and unfamiliar tones, when in reality he is silent. Thus the case presented to the observer would be that of a patient who did not answer questions because he imagined he had already done so. As a matter of fact, mutism is frequently observed in association with "audible thinking"; but this conjunction, however brought about, certainly does not make for Cramer's hypothesis, which fails to explain even the auditory hallucinations. In visual hallucinations the patient has the sensation that he *sees*, in auditory hallucinations that he *hears;* in hallucinations of the muscular sense he must, as Ziehen[1] has expressed it, "have the sensation that he *is uttering* a certain word."

[1] Ziehen, *Psychiatrie* (1894), p. 23.

CHAPTER VI.

THE CONTENT OF FALLACIOUS PERCEPTION.

The Content dependent (1) *on Memory and Experience*—(2) *On the Conditions which induce the Hallucinated State*—(3) *On the Temperament and Mental Environment of the Individual*—(4) *On the Brain-state which obtains at the Moment* (*Exhaustion, Concentration, Emotions, Subconscious Processes*)—(5) *On the Sensory Stimuli.*—*Explanation of some Facts generally misinterpreted*—(1) *Certain phenomena usually cited in support of retinal participation.*—(2) *Negative Hallucinations*—*The Phenomena and Nature of Rapport*—*Negative Hallucinations not explained by diversion of attention*—*Their true Nature.*

THE content of a fallacious perception depends primarily on the past experience of the individual. Only what has passed in at the portals of sense can be reproduced. The neural elements which attain to activity may indeed be associated in the most unfamiliar and *bizarre* combinations, but they can be called into play only in the way to which they have been predisposed by former sensory stimuli. The so-called auditory hallucinations of deaf mutes, often adduced as an argument against this view, may in all cases probably be explained as heightened perception of the arterial pulsation—that is to say, as unwonted, but still objective, organic sensations. It is indeed conceivable that an auditory stimulus

may be perceived, but not as an *auditory* perception, reaching the cortical cells by the aid of certain nerve-fibres which normally convey sensations of pain. At least Politzer[1] has furnished some evidence for such a view by demonstrating that in the acoustic nerve, side by side with the fibres which transmit impressions of sound, there are others which convey a specific sensibility of their own. We hear, too, of visual hallucinations in persons blind from childhood. But these accounts relate either to cases in which, though the blindness occurred at a very early age, visual impressions had been received previous to its occurrence, or else to those in which at least some sensibility to light and darkness remained. The case of the blind man mentioned on page 137, Note 1, is typical of the state of those blind from birth. They have not even the ghost of an idea of light and darkness, and consequently have no visual hallucinations.

What part of experience shall be reproduced in the hallucination is, however, determined by a combination of various circumstances.

An important influence on the specific character of the false perception is generally attributed to the cause which brings about the underlying state. Thus hallucinations accompanying disease almost invariably assume distressing forms. They may, it is true, begin indifferently, or even be of an agreeable nature at the outset, but as the disease progresses and their content becomes profoundly modified by morbid

[1] A. Politzer, "Zur Theorie der Hyperæsthesia Acustica," *Arch. f. Ohrenheilk*, v., sec. 206 (1869).

organic sensations, they tend to become more and more vexatious and intolerable to the victim. The same general tendency, pointing to the same explanation, is to be observed in the visions of ether-inhaling, opium-eating, etc., as the habit leads on to ever larger doses of the drug. Much has been written about the specific influence of certain poisons, such as haschisch or opium, on the content and emotional character of the visions associated with them, and no doubt they do, within certain limits, exercise such an influence, though to a less extent than was formerly supposed. Other causes may modify and counteract it, and this explains why the specific action of the narcotic does not in all cases account for the phenomena observed. To quote one example among many, Schrenck-Notzing,[1] in his experiments with haşçhisch, obtained very dissimilar results. They do not indeed generally contradict the tendency of this narcotic to excite pleasant images, but nevertheless in one of his six cases the very opposite of the usual effect was produced; the customary feeling of well-being was absent, and in its place came horrible sensations, nameless terrors, and the fear of madness. Even music, which affected others pleasantly, aroused in this subject distressing memories. Of course the somatic effects of poisoning, the tendency to vomit, and so on, may have contributed to the result (compare Note 8, p. 44, on the subject of chloroform delirium). This is indeed indicated by the feeling of ease which followed the act of vomiting. Nevertheless, the influence of organic sensations on the dream content was probably of secondary im-

[1] Schrenck-Notzing, "Die Bedeutung narcot. Mittel für den Hypnotismus," *Schriften d. Ges. f. psych. Forsch.*, i. vol. 1.

portance, for we find this note appended to the description of the case:—"Tendency to neurasthenia with general hypochondriacal diathesis . . strongly marked pessimistic temperament of the narcotised subject in normal life." Thus we encounter another important factor neutralising the specific action of the drug.

This is the influence of individual temperament. For just as the temperaments of the drunken are exhibited in their actions, this one becoming talkative and boastful, and that one melancholy and silent, a third maudlin, a fourth tetchy and violent, so also are they reflected in the hallucinations which accompany this state.[1] The ancient Arabs held that a man's character could be learned from his dreams. They assigned visions of fire and light to the choleric temperament, serpents, scorpions, and darkness to the melancholy, rivers, seas, ice, and snow to the phlegmatic, gardens and meadows to the sanguine.[2] Others have held that the phlegmatic temperament is little liable to sense deceptions, whilst the sanguine is specially prone to them. The lunatic of sanguine temperament, says Radestock, is puffed up and vain, his dreams are all of marble halls and flattering voices; the choleric patient suspects everywhere the plots of his enemies, and hears voices insulting him or urging him to deeds of violence, and whilst his hallucinations are more often auditory than visual, the contrary is the case with the melan-

[1] Radestock, *op. cit.*, p. 209. "Not that temperament is transferred bodily into the dream-state, causing dreamers to be distinguished as choleric, melancholic, sanguine, and phlegmatic. In dreams we all belong more or less, as far as the emotions are concerned, to the sanguine class, but our individual temperament nevertheless decides the content of our visions."

[2] Pfaff, *Das Traumleben u. seine Deutung* (1868), pp. 107 *et seq.*

cholic, and especially, as the name implies, with religious "visionaries."[1]

Again, it has often been remarked that the sensory deceptions vary in character with the imaginative power of the individual—for instance, that the hallucinations of unimaginative minds tend to be meagre and colourless. Differences of age and sex also exert an influence.[2]

"The boy dreams otherwise than the youth. The dreams of the prime of life are very different from those of age, when life itself seems sometimes half a dream; the young girl's dreams are unlike those of womanhood and wifehood. The bright hopes and ideal enthusiasms which belong to youth cast their glamour over its dreams too; while the serious labours of the man, his disciplined energy, are reflected in the dreams of maturity. Maidenly timidity and reserve, the devotion of the wife, the self-sacrificing love of the mother, often find their echo in dreams. All this becomes clear when we realise how great is the influence of sex and age on the intellectual and emotional life of the individual."[3]

Then, again, the mental environment in which the individual lives and moves, his calling and associates, the belief and superstitions incident to his time and country, not only serve to determine the ease with

[1] Radestock, *op. cit.*, p. 209; Hagen, *Die Sinnestäusch.*, pp. 139 *et seq.* Griesinger, *op. cit.*, p. 165, on the contrary, denies that the four categories have been empirically proved, or that any weight should be attached to them in relation to insanity.

[2] Radestock, *op. cit.*, p. 210. Speaking of the difference of the sex characteristics, *ibid.*, pp. 203 *et seq.*, he says, "Burdach contrasts them as individuality and universality, Ulrici as activity and passivity, Beneke as power and sensibility, Hartmann as conscious and unconscious power." W. von Humboldt holds that the masculine genius is characterised by analysis and creative activity, and the feminine by synthesis and conservatism. Compare Lotze, *Mikrokosm.* (2nd edit.), pp. 380-388; *Medici Psychol.*, pp. 556-560; J. Bahnsen, *Beiträg zur Charakterologie*, vol. ii. pp. 297 *et seq.*

[3] Spitta, *op. cit.*, p. 302.

which certain ideas are reproduced, but also influence the hallucinatory responsiveness of certain selected elements. Thus the sufferers in olden times were tormented by witches and tempted of the devil. Then electricity and magnetism, telephones, and other mechanical contrivances played a part, while nowadays complaints even reach us of "telepathic influence." In Plato's time the victim was haunted by interminable flute-playing;[1] now he is afflicted by the constant ringing of bells. We might also instance "second sight," the similarity of the visions in one race or one family, the general resemblance of the ghosts which haunt old castles, of churchyard spectres, and of other local apparitions, besides epidemic visions.

It sometimes happens, to quote another class of sensory deceptions which has been repeatedly brought to my notice, that when a mental process which usually occurs with great regularity is accidentally omitted, its place is supplied by a hallucination. Thus Herr von M—— told me that when taking his usual afternoon walk he used to see regularly on reaching a certain spot the head of the squadron returning from their daily exercise, and crossing the street at some little distance in front of him.[2] One day when he had seen this as usual it occurred to him to wonder why the rest of the troops did not follow, and he soon discovered that the cavalry he had seen on this occasion were phantoms.[3]

[1] Plato, *Crito*.

[2] This part of the communication was not meant as an explanation of the hallucination, but was merely given to fix the exact time of its occurrence.

[3] See Report, cases 19. 23 and 284. 23; and also the case quoted below in Chapter IX., where two sisters, in a state of expectancy, see

Again, it sometimes happens that a sensory impression is followed by a false perception whose content is not suggested by habit, but by some other circumstances, a state of anxiety or apprehension for instance. The following case offers a good illustration :—[1]

"Some years ago, a friend and I rode—he on a bicycle, I on a tricycle—on an unusually dark night in summer from Glendalough to Rathdrum. It was drizzling rain, we had no lamps, and the road was overshadowed by trees on both sides, between which we could just see the sky-line. I was riding slowly and carefully some ten or twenty yards in advance, guiding myself by the sky-line, when my machine chanced to pass over a piece of tin or something else in the road that made

hallucinatory figures. C. E. Seashore, "Measurements of Illusions and Hallucinations in Normal Life," *Studies from the Yale Psychol. Laboratory*, iii. (1895), pp. 46 *et seq.*, records the following experiment :—"A blue bead, spheroidal, the shortest diameter being 1.8 mm. and the longest 3.5 mm., was suspended by a fine black silk thread in front of the centre of a black surface surrounded by a white circular border, whose inside diameter measured 50 mm. By a concealed device the bead could be drawn away and replaced without the observer's notice. A tape line was stretched from the apparatus to a point 6.5 metres directly in front of it. The method employed was first to show the observer the bead in its position, then require him to go to the further end of the tape line and walk slowly up towards the apparatus until he could first see the bead distinctly. When he saw the bead he read off the distance from the apparatus on the tape line. I recorded the distance while he went back to repeat the trial nineteen times in the same way. In the first ten trials the physical conditions were similar, but while he went back to start for the eleventh time I pulled a cord which slid the bead behind the frame. The observer, not knowing this, walked up as usual, and when he came to, or a little beyond, the point where he expected to see it, he generally did see it and read off the distances as before. . . . As a rule, the 11th, 16th, 18th, and 20th trials were made with the bead withdrawn. . . . About two-thirds of the persons I tried were hallucinated."

[1] G. J. Strong, "On the Limits of Vision," *The Philosophical Magazine*, March 1894, quoted from the Report, p. 178.

a great crash. Presently my companion came up, calling to me in great concern. He had seen through the gloom my machine upset and me flung from it."

The Momentary Cerebral Relations.—With this example we pass from individual differences of temperament and circumstance to another element in the content of a hallucination, viz.:—to the brain-state which obtains at the time of its occurrence. Here, generally speaking, two forces are to be reckoned with—first, a negative factor, the state of exhaustion of the over-strained elements; second, a positive factor, the increase of tension, brought about by secondary, and for the most part unconscious, processes of the sensory stimuli in these elements which, being relatively in a state of rest, are able to recuperate themselves. The exhaustion of the elements recently stimulated explains the familiar fact that the ideas with which our waking thought has just been occupied do not usually furnish forth our dreams. Either these ideas are submerged for the time or they serve only to suggest other associated ideas which appear as dream-images.

On the other hand, attention, by increasing the tension of certain selected elements, has a most potent influence on the content of sensory deception. It enables us consciously and deliberately to construct new objects from the forms and colours actually present to our eyes. Thus we "find the cat" in a "puzzle picture," for instance. Johannes Müller relates that when a child he used to busy himself by the hour making pictures from the cracks and stains in the wall of the opposite house. Other children love to fashion out of the clouds dragons, fish, ships, and such fantastic forms. In the same way,

country folk will point out to the passing traveller the likeness of some distinguished person in a jutting headland or rocky cliff.

The selection of the elements to be aroused by the sensory stimuli may be brought about not only by the voluntary exercise of the imagination and the capricious interpretation of forms, etc., but involuntarily by the emotions or mental condition of the moment. When darkness has attuned the mind to fears the benighted traveller suspects a robber in every tree stump. The lover at the trysting-place thinks every moment that he sees his mistress approaching or hears her step (Schiller's *Erwartung*). Passion is proverbially blind to all defects, and endows its object with ideal beauty. A child may seem "a little angel" in the parental eyes, though his plainness is a by-word among the neighbours. The inexperienced sportsman, in his overzeal, hears in every rustling sound the stag's approach. The sad, the anxious, the suspicious, the wrathful, read scorn, threats, affronts, etc., in every action or gesture of those about them.[1] These symptoms are of course most strongly marked in insanity, and are amongst its commonest phenomena. In mania, in many cases of excited dementia, and also in melancholia, mistakes of identity may often be observed, and the misinterpretation of some sound, word, or movement in accordance with the dominant insane idea of the moment.

The cases of crystal-vision quoted above make it sufficiently clear that the content of hallucination is often influenced by the activity of processes beneath

[1] See Appendix I., case ix. 18, from the Report of the Munich Collection.

the threshold of consciousness, that is to say, by subconscious ideas. A further example is furnished by the following case, in which an object was voluntarily called up, and appeared with a distinctness and detail which the conscious mental image could not possibly possess.

"X., a medical man, noticed that when he rubbed his eyes on waking colour phenomena, chiefly red and golden yellow, appeared. As he idly watched them he began to try whether he could call up particular colours by thinking about them. He succeeded in doing so, but only after the appearance of other colours. He seemed to note, however, a certain regularity in the order in which the colours appeared. Then it occurred to him to try whether he could make himself see an object as well. He chose for his experiment a microscopic preparation of the liver. He is quite convinced that his memory-image of this object was confused and vague; nevertheless, the preparation suddenly appeared before his eyes, as though seen through the microscope, all the markings distinctly visible, and the arteries, veins, and bile ducts beautifully coloured in red, blue, and greenish violet."[1]

To this class also belongs the kind of hallucination described by Griesinger, in which the patient hears agreeable words with one ear and disagreeable words with the other.

[1] See Report, 49. 5 and 402. 8 (pp. 142-144). In the first case the shock of the fall on the head, and no doubt also the feeling of terror accompanying the accident (the percipient was thrown from a dog-cart), called up the hallucination of an experience which had happened to the percipient as an infant, but from the knowledge of which she had always been carefully guarded. In the second case the apparition of a young farmer's wife, who had been killed many years before by the falling of a tree, was called up by hearing a great gale of wind, and by the presence in the house of a nurse having the same name as the victim of the accident. The percipient did not at first recognise the figure, not indeed until a week after.

"Magnan[1] cites several such cases. A patient with pronounced epilepsy and paranoia heard insulting voices on the right side. To this stage succeeded one of exaltation and self-esteem, and now encouraging and eulogistic voices presented themselves on the left. A devil took possession of his right ear, a good genius of his left, forming together a sort of Manicheeism which governed him. As the ideas of greatness increased the insulting voices on the right side desisted. An inebriate heard mockeries on the right, and consoling, reassuring words on the left. Two other cases also refer to dipsomaniacs with double auditory delusions, unpleasant on the left and pleasant on the right. In all four cases the ears were normal, and the acuteness of hearing the same on both sides.

"Dumontpallier induced similar 'double unilateral' hallucinations in hypnotised hysterical subjects. For instance, he described an amusing scene, a village fair, to the patient's right ear, while some one barked like a dog at his left, whereupon the right side of the face smiled, while the left wore a startled expression."

I do not think that these cases can be taken as evidence for the functional independence of each half of the brain, nor that we should be justified in concluding from them that one hemisphere was affected before the other. The natural opposition of right and left seems to me sufficient to explain the spontaneous cases. The right ear being already beset by mocking voices, the auditory hallucinations which accompanied the ideas of pride attached themselves perforce to the left ear, and mockeries on the right, flatteries on the left, expressed the inner antithesis. Of course suggestion sufficiently accounts for the hypnotic cases.

The Sensory Stimuli.—Lastly, the sensory stimuli to which the hypnotised or narcotised subject is exposed, whether originating in the external world or in the organism itself, exert an important influ-

[1] Magnan, *Archives de Neurologie*, vol. vi. p. 336.

ence on the content of the hallucinations. They operate by suggestion, by calling their related element-groups into action. We have already, while considering the dream-state, met with a number of instances showing how the dream-content depends on the sensory stimuli, and similarly the action of these is to be observed in hypnotic and narcotised subjects, in cases of intoxication[1] and spontaneous somnambulism, in many hysterical states,[2] etc. The Report contains a chapter dealing with their influence on waking hallucinations, but it seems to me that in considering individual cases the committee may have overlooked, or at least underrated, this formative power of circumstances and surroundings. A careful distinction is drawn by the Nancy School between the effects of stimuli—between processes due to suggestion and self-suggestion—and the pre-requisite pathological or physiological condition of heightened suggestibility, which its researches have thus tended to elucidate. This it is which gives to the views of this school their great advantage over those of the Salpêtrière, and gives them, moreover, a scientific value wider than the limits of hypnotism. For by emphasising this fundamental law, by showing the many sources of error in the introspective method, and assigning to self-observation a less important place, hypnotism has conferred a great benefit on psychological science in general.

In illustration of the way in which sensory stimuli

[1] Von Schrenk-Notzing, *Die Bedeut. Narc. Mittel*, etc.

[2] Compare Friedmann, *Ueber den Wahn*, pp. 38, 39. This case—to which Friedmann gives an obviously false explanation, viz., that it is the independent product of imaginative activity—is really the hallucinatory expression of the "globus hystericus."

act suggestively on the content of false perception, it may not be amiss to quote here the well-known experience of Lazarus, which serves also to indicate the part played by after-images.

"One very clear afternoon I was on the Kaltbad terrace at Rigi looking at the Waldbruder, a rock which stands out from the great wall of mountains crowned by the glaciers of the Titlis, Uri-Rothstock, etc. I was looking alternately with and without the telescope, trying, but in vain, to make out the Waldbruder with the naked eye, though I could see it quite plainly by the aid of the glass. After straining my eyes to no purpose, for a period of six to ten minutes, by gazing fixedly at the mountains, whose colouring changed with the various altitudes and declivities from violet and brown to blackish-green, I gave up the attempt and turned away. At that moment I saw before me (I cannot recollect whether with eyes open or shut) the figure of an absent friend, like a corpse.

. . . . . .

"I asked myself how I had come to think of this particular friend. In a few seconds I regained the thread of thought which had been interrupted by my looking at the Waldbruder, and I soon found that a very natural association of ideas had called up my friend's image to my mind. His appearance was thus explained, but why had he appeared as a corpse? At this point I closed my eyes, either because they were tired, or in order to think the better, and at once the whole field of sight, over a considerable extent, became covered with the same corpse-like hue, a greenish yellow-grey. I saw at once that here was the key to the desired explanation, and tried to call to mind the forms of other persons. And as a matter of fact these also appeared like corpses, standing or sitting as I wished, all had a corpse-like tint. They did not all appear as sensible phantasms, however, and moreover, when I opened my eyes the hallucinatory figures either disappeared altogether or became very vague and dim. . . . It is plain that here an inward reminiscence, arising in accordance with the laws of association, had combined with an optical after-image. That is to say, that an excessive stimulation of the periphery of the optic nerve had indirectly

provoked a persistent subjective sensation of the complementary colour, which became incorporated with a memory-image."

It is not necessary to describe here the preparatory suggestions—stimuli applied to the sense of hearing, the muscle-sense, etc.—used in hypnotism to induce the cerebrostatic condition favourable to hallucination. Münsterberg's[1] experiments offer a good parallel. He called out a word to the subject, and then let him have a short glimpse of another word, illuminated only for .02 seconds, which had some inner connection with the word called out. In the course of the experiment some words were selected for illumination which had no real connection with the meaning of the spoken word, but could by an easy misreading be changed into a word having such a connection. In 8 to 10 per cent. of the experiments a misreading, that is, a hallucination, was induced. For instance—word called, *Verzweiflung* (despair); word read, *Trost* (consolation) instead of Triest (Trieste). Word called, *Nerventhätigkeit;* read *Muskelfunctionen* instead of *Modulfunctionen.* Binet communicates a curious case. A friend of his, Dr. A., was walking along a Paris street, his mind full of an impending examination in botany, when he suddenly saw the words "Verbascum thapsus" inscribed on the glass door of a restaurant. After proceeding a few paces he turned back in astonishment and read the real inscription on the door, which was simply "bouillon." Now, the popular French name for the plant Verbascum thapsus is "bouillon blanc."

From my own experience I can also furnish an example of the formative influence of external

[1] Münsterberg, *Beiträge zur Experimentellen Psychologie*, vol. iv. (1892).

stimuli on the content of false perception. I was hurrying home one cold winter day, hungry and somewhat tired after my work. The snow was lying on the street. As I went along the right-hand pavement, a brown horse, led by an officer's groom, came towards me and passed me on the left without my particularly noting it. On turning the corner I started slightly, for at that moment a grey horse slipped with a clattering noise and swerved to the right close in front of me as if to recover itself. This was, however, a sensory delusion. In reality, a street boy had fallen with a loud clatter just in front of me on the frozen gutter. This noise, and the visual impressions of the horse I had just passed and of the snow-covered ground, had become, at the moment of my startled awaking out of a day-dream, blended together into the false perception described.

Apparent Retinal Action accounted for by Suggestion.—Having now taken our bearings, let us turn our attention in the next place to a group of phenomena often quoted to support the view that the retina shares in the hallucinatory activity, as the result of a centrifugal wave. Some of these cases yield interesting illustrations of the manner in which the content of false perceptions is formed. Such are the experiments of Parinaud, whose hypnotised subjects saw the colour suggested to them on one-half of a sheet of white paper divided by a line down the middle, but saw spontaneously the complementary colour on the other half of the sheet. Again, Lombroso[1] reports that with a suggested spectrum seen

[1] Lombroso stated in his paper read to the Psychological Congress in Paris that he obtained this result in 96 per cent. of his cases.

through suggested coloured glass he obtained the same results as if the spectrum and coloured glass had been actually present; and Féré and Binet found that where two hallucinatory colours were superimposed upon one another, they became blended like the corresponding rays of the spectrum. But even supposing all these experiments to rest on correct observation, they are yet very far from proving that the retina is involved. There is indeed no reason for supposing that the action is not purely cerebral. In any case it is evident that we are here dealing with the phenomena of suggestion and self-suggestion. This applies, of course, to all cases where the phantasm is doubled by pressure on the eyeball,[1] or by introducing the prism, or is mirrored in a reflecting surface—to all cases, in fact, where the hallucinatory phenomena behave as though amenable to optical laws.[2] They all depend on artificially induced changes in the sum of the instreaming stimuli, through which changes in the relative tension in the centres, and thus corre-

[1] Brewster is frequently referred to as the discoverer of this fact, whereas he attempted to distinguish between a visual phantasm and an objective perception by maintaining that the former could not be doubled by pressure on the eyeball.

[2] Pick, *Neurol. Centralbl.* (1892), No. 11. Dancing figures seen through a lens were diminished in size, and assumed the colour of the medium through which they were seen. The cases noted in crystal-vision, where one crystal-picture shows a colour complementary to that of the preceding one, where, for instance, a lady in a blue gown is followed by a boy clad in orange colour, require a different explanation. In any case they depend on entoptic phenomena which furnish the starting-point of the visual deceptions, and act also as a factor in their content. A blue entoptic phenomenon becomes a lady in blue, a subsequent orange-coloured impression is seen as a boy, etc. But this second entoptic phenomenon which started the second hallucination is not the after-image of the first hallucination, but of its *point de repère.*

sponding changes in perception, are brought about.[1] Bernheim has succeeded in demonstrating in a series of experiments that all such phenomena are to be referred to central processes,[2] and we can only marvel that their true explanation is still so commonly overlooked, and that they are still pressed into the service now of this theory and now of that. Sometimes even their occurrence is regarded as affording a crucial test in diagnosis. Thus Tigges, whose interesting article I have already quoted more than once, regards it as a proof that the retina is involved if double images are produced in insane cases by pressure on the eye and consequent divergence of the axes. In a note[3] he himself adds, however, a case of A. Hoche's (bilateral

[1] This is very clearly shown in Brach's "Geschichte eines Phantasma Visionis," *Med. Zeit.*, v. ver. f. H. in Pr.

[2] Bernheim, *De la Suggestion*, etc., pp. 102 *et seq.* These experiments are also of interest as illustrating the way in which the imagination seeks to adapt itself to changes of circumstance, whilst ignorant of the natural results of such changes, and how the first self-suggestion when firmly established becomes a dominant idea. In the case of Bernheim's first subject, L. C., the form of the question or some such circumstance seems to have suggested that the spinning of the colour-disc would produce a change in the hallucination, which she interpreted as its disappearance. So in experiments 1, 2, the hallucination came to an end on each occasion she saw the white disc white. But these two experiments and one in the waking state sufficed to make her see the revolving disc white even when it was in reality blue. (Experiments 4-5.) The second subject evidently did not expect that the spinning of the disc would cause any change, for its effect on her was nil. In all the experiments recorded (1-3) she saw both colours unmixed. So, in the first instance, did the third subject, but she saw them blended when she had been commanded to do so. It is evident, however, from experiment 5 that this blending of the colours did not follow optical laws, but was the effect of association, since blue and orange appeared to the subject mingled "as in a sunset,—flame-colour."

[3] *Loc. cit.*, p. 317, note.

hemianopsia inferior) in which the hallucination, although evidently conditioned centrally, was yet doubled, the images partly overlapping on sideways pressure of the eyeball.

Nor should much weight be attached to the statement frequently made, that the hallucinatory image is doubled by pressure, or by the prism, even when the subject has no idea of the expected result. For, as I have already pointed out, the cause of the altered perception in these cases is not a cerebrostatic change conditioned by expectation, but a change in the sum of the stimuli acting at the moment.

This explains the observation of Philippo Lussana,[1] that hallucinations are distorted which occur during the progressive darkening of the visual field in atropin poisoning—a good example of the way in which the distorted perception of objective impressions (resulting from the failure of co-ordination in the eye-muscles) is transferred to the hallucination. The wavering to and fro of the appearances in nystagmus may also be instanced, the distorted figures of fever delirium, the "gigantic" hallucinations of epileptics with macroptic vision, etc.

Again, the implication of the external sense organ has been inferred from the fact that many hallucinations vanish when the eyes are closed;[2] and when the ears are stopped the haunting voices frequently cease.[3] But since these results may also be observed when peripheral excitation is excluded and central ex-

[1] *Annal Univers* (Giugno, 1852).

[2] Reil, *Rhapsodien*, p. 171; Griesinger, *op. cit.*, p. 90; Michéa, *op. cit.*, chap. ii.; Leubuscher, *op. cit.*, p. 47; Brierre de Boismont, *op. cit.*, p. 577; *Allg. Zeitschr. für Psych.*, xlvii. p. 52.

[3] Compare Pick, *Neurol. Centraibl.* (1892), No. 11.

citation clearly indicated, they can hardly be taken to prove the former.[1]

In seeking to explain the disappearance of the phenomena on closing the eyes, we must remember that no change has taken place either in the general state favourable to hallucination or in the pathological stimulus. A continuation of the hallucination is therefore to be expected, and, as we shall see, does actually occur. But with the closing of the eyes a new cerebrostatic condition steps in, for with this act the perception of darkness is inevitably associated through long experience (in the same way as an enfeebled perception of sounds is associated with stopping of the ears). Excitation is therefore set up in the element-complex which usually acts in association with this perception, and from the periphery at least no contrary stimulus streams in. The tension in this complex may, therefore, under favourable circumstances, rise to such a height that the central excitation streams towards it, instead of to the groups usually affected, causes its discharge, and so sets up a new, a "negative" hallucination.[2]

[1] Tigges, *loc. cit.*, quotes a case of Schüle's, where in severe congestion of the left hemisphere right-sided hallucinations disappeared on closing the eyes; further cases of Sepilli, Tomaschewsky, Simonowitsch, and others. Compare Hammond, "Unilateral Hallucinations," *Med. News* (Phila., 1885), pp. 687 *et seq.*

[2] This view is further confirmed by the observations of Urbantschitsch, and also of Wyss, of the Geneva Otological and Laryngological Institute, who succeeded, by means of hypnotism, in lessening, if not altogether abolishing, subjective noises associated with bilateral catarrh of the middle ear. Arn. Pieraccini, "Un fenomeno non ancora descritto," etc. (*Riv. sperim. di freniatria e di med. leg.*, xviii. 2), concludes that the disappearance of the hallucination was due to suggestion in the case he describes. This patient, an imbecile with sexual perversions (onanistic), suffered from visual hallucinations, which

As, however, I am convinced that the nature of these "negative hallucinations" has been generally misunderstood, I propose to devote some space to their consideration; and since it is certain peculiarities in the way their content is built up which have led to these misconceptions, this seems the proper place to deal with them.

The Negative Phenomena of Rapport.—One of the most striking phenomena of the hypnotic state, and one which early attracted the attention of observers, is what is called *rapport.* This consists, as is well known, in the establishment of a specific relation between the hypnotic subject and the hypnotist, or agent. In its most strongly marked form the subject feels only the hypnotist's touch; only the hypnotist can move his cataleptic limbs, which remain otherwise stiff and inert; he hears only the hypnotist's voice, and obeys only his commands. Do what they will the others present cannot get into relation with the hypnotised subject. He does not hear them, he does not even feel a needle thrust into his arm by one of them, nor the electric current if they apply it. In the hand of the agent the magnet can make the patient pass from one state into another; in the hand of the bystanders it produces no effect whatever.[1] The person in *rapport* with the subject will be heard by him even when he speaks so low that the bystanders

disappeared if one of his eyes were closed, *no matter which.* He was also amenable to suggestions given in the waking state. H. Higier, *op. cit.*, aptly emphasises the influence of the psychical factor in modifying and suppressing the hallucinations.

[1] Krafft-Ebing, *Eine Experimentelle Studie auf dem Gebiet d. Hypnotismus*, pp. 29, 35, 37.

cannot catch his words.[1] On the other hand, the subject does not hear the hypnotist unless directly addressed by him, but as soon as the latter turns to him again the words penetrate to his consciousness, are understood and obeyed. This is the most pronounced form of *rapport* ("isolated" rapport, as it has been frequently described by the mesmerists). More careful observation, however, has shown that this form is the exception rather than the rule, at least in cases where leading suggestions are scrupulously avoided. *Rapport* occurs in different persons in various degrees, shading off from the "isolated" *rapport* just described on the one hand, through countless gradations of "special *rapport*" to a "general *rapport*," in which the commands of all and sundry are understood and obeyed; and on the other hand, from "isolated" or exclusive *rapport* through "passive" hypnosis to sleep without *rapport*, in which not even the commands or touches of the hypnotist penetrate to the subject's consciousness. No definite connection has been proved between the degree of *rapport* and that of suggestibility.

Now *rapport* has been frequently connected with certain phenomena known as "negative hallucinations," which consist in the non-perception of certain objective sense-impressions. According to Moll,[2] *rapport* may be regarded as a condition "in which the action of spontaneous attention is almost wholly in abeyance, while, on the other hand, reflex attention is abnor-

[1] F. W. Barrett, *Proc. of the S.P.R.*, vol. i. p. 241. Frankly, the case he mentions is not free from objections; even the most elementary precautions seem to have been neglected.

[2] Moll, "Der Rapport in der Hypnose," *Schriften d. Ges. f. psych. Forsch.*, parts iii. and iv., p. 227.

mally active. The subject who presents the phenomenon of true, exclusive *rapport* is not in a condition in which he can turn his attention freely to this or that person. It is wholly directed to the person who is able by means of some sensory impression or other to insinuate himself into the subject's consciousness;" hence the negative phenomena of *rapport*, considered by Moll and others as negative hallucinations.[1]

There are, as Moll proceeds to point out, certain analogous phenomena in the normal state which are conditioned solely by the fact that the attention is concentrated on a certain point, generally determined by individual interest. For instance, in any gathering of children where their mothers are also present it may be seen that each mother watches her own child and hardly remarks the other children at all. She hears every word her own child utters, but the prattle of the others does not reach her. Or, again, in states of excitement and emotional exaltation, consciousness becomes even more completely possessed by one impression. The angry man, absorbed in his wrath, ignores what is going on around him, and turns a deaf ear to good advice. These, Moll considers, may also be regarded as negative hallucinations, and in elucidation of the negative hallucinations of hypnosis, he points in another place[2] to the success with which jugglers execute their card tricks, etc., by diverting the attention of the on-lookers.

Wundt[3] also inclines to this view; but whilst admitting the part played by diversion of attention, he

[1] *Ibid.*, p. 225. [2] Moll, *Hypnotism*, p. 96.
[3] Wundt, *Hypnotismus und Suggestion*, pp. 64-66.

ascribes a large share in the production of negative hallucinations to a second factor, "the peculiar nature of the visual and auditory impressions in drowsy and somnambulic states;" for unless brought into prominence by special circumstances, such impressions tend to be perceived dimly and indistinctly, as though from a long way off. "Negative hallucinations," he continues, "occur generally as a result of the lowered sensibility of the sensorium aided by various positive factors, consisting partly in 'supplanting' hallucinations, partly in the diversion of attention into another channel, and partly in the simple automatic response to suggestions."

This explanation appears to me fallacious, at least as far as concerns hypnosis, since it postulates an independent diminution of excitability in the sensorium. We are justified in assuming such a general diminution of sensibility in the organ as a result of intoxication, anæmia, or fatigue; but in hypnosis, which, as Wundt expressly states, "does not originate in an exhausted state of the nervous system," there is no ground for a like assumption. Besides, Wundt himself elsewhere explains as a result of diversion of attention this diminished responsiveness to stimuli, which he here regards as the chief factor in the production of negative hallucinations, and beside which he here ascribes to diverted attention only a secondary part.[1]

[1] Wundt, *op. cit.*, p. 62. "This diverted attention occurs most often when, as is generally the case, the suggestion is given by a particular person—*i.e.*, by the hypnotist, who thus from the outset directs the sensibility of the subject to himself, to impressions emanating from him, and, *in accordance with the principle of compensation*, lowers in a corresponding degree his power of reacting to other stimuli. Thus the phenomena of *rapport* are explained, being, in fact, nothing more or

Thus, in order to explain *rapport* and its negative phenomena, firm fixing of attention must be postulated—"tonic cramp of attention," as Stanley Hall calls it. In other words, *rapport* and all its symptoms may be referred to the different degrees of distinctness in the perception according as the elements which the stimuli encounter are in a state of heightened or lowered tension. If the stimuli encounter elements in a state of high tension the impressions are perceived hyperæsthetically; if, on the other hand, the elements affected are in a state of lowered excitability, owing to the diversion of attention and its "cramped" fixation on another point, they are unable to overstep the threshold of consciousness.

The varieties of manifestation in *rapport* which Moll has pointed out in his monograph on the subject[1] are most simply explained as dependent on self-suggestion. When a certain action is suggested to a group of hypnotised subjects in a manner which leaves some scope for individual modifications in carrying out the command, all manner of individual differences will be displayed. Suppose, for example, the hypnotist says, "You are limping with the left leg, my poor fellow; just walk up and down the room for a minute and let me see what is wrong." The first subject will bend his leg inwards, a second will carry out the command with his foot at an

less than the sum of the symptoms resulting from this attention directed to the hypnotist." If in certain hypnotic cases sensation is really feebler and less distinct, this is not to be regarded as a circumstance conditioning negative *rapport* phenomena, but as a weaker form of the *rapport* itself, in which the fixation of attention does not indeed cause the excitability of the other elements to sink to zero, but lowers it in a certain degree.

[1] Moll, *Der Rapport*, etc., pp. 51-66.

abnormal angle, a third will develop a stiff knee, a fourth will drag a broken leg. Each works out the idea independently. In a series of experiments instituted for another purpose I regularly introduced this experiment, and usually obtained varied representations like those just described. I was the more astonished when, on one occasion, among a group of village lads, the same type recurred over and over again. Only one subject showed a distinct divergence from the common type. Further inquiry revealed the fact that in the village to which all these lads belonged there lived a man with a misshapen foot who limped in the way which all the subjects had imitated; all, that is, with the exception of a lad who had broken his leg in childhood, and was no doubt reproducing an experience of his own.

And just as we find individual differences shown in these experiences, so we may assume that the degree in which the attention is fixed on the hypnotist varies with different subjects, and that a similar diversity obtains in the manner in which the subject carries out his conception of the *rapport*. So far, at least, *rapport* does not depend on the degree of suggestibility, for in certain cases very deep hypnosis, with responsiveness to all kinds of suggestions, that is to say with "general *rapport*," occurs without any appearance of *rapport* phenomena.[1] On the other hand, it must be admitted that, *cæteris paribus*, in cases of complete exclusive *rapport* the suggestibility must also be greater.

The negative symptoms associated with *rapport* are also found outside hypnosis in many other states.

[1] Moll, *Der Rapport*, etc., p. 58.

They are manifested, for instance, in the waking state, as a result of active or passive inattention. The scholar whose mind is preoccupied by some abstruse train of thought does not notice the heavy rain, and comes home, drenched to the skin, with his umbrella tucked under his arm. The pickpocket avails himself of a similar state of absorption to steal the purse of the shop-gazing lady, no matter how well guarded her pocket. The chess-player, pondering his next move, does not hear when he is called, and the child playing in the street is deaf to the driver's warning shout and to the sound of the wheels that in a moment will pass over him. By means of a timely joke or calculated gesture the conjurer succeeds in diverting our attention from his sleight of hand. The pickpocket's accomplice hustles us with the same object. A friend once drew me into a discussion in the railway station which proved so absorbing that I failed to hear the shouting and bell-ringing which announced the departure of my train.[1] The obliviousness which causes a man to hunt all over the room for a book which he is holding under his arm forms a sort of connecting link with another class of negative phenomena parallel with the negative phenomena of *rapport*, to wit, those states of emotion and excitement in which sensory stimuli often fail to reach the consciousness. I have already quoted one case of the kind from Moll; and such expressions as "blind passion," "blind zeal," are proverbial. Animal life also furnishes us with illustrations. Dogs in the fury of fight do not hear their master's call, and are

[1] Compare Rells, *Psychol. Skizzen.*, p. 97.

indifferent to the blows with which the bystanders seek to separate them. It is useless to whistle to the greyhound when he has scented a hare. He is not so much disobedient as deaf. The black cock in the breeding season falls an easy prey to the sportsman, and many a poor hare, blind and deaf with terror in the battue, runs right up to the guns. Ecstasy, where analgesia and anæsthesia are generally associated with pleasant hallucinations, offers further examples, and also melancholia attonita, which may be regarded as its emotional antithesis, seeing that it exhibits the same symptoms in connection with profound mental depression. Both in ecstasy and melancholia the analgesia may be so great that severe burns and other injuries do not reach the consciousness.[1] A melancholic, for instance, will dig his nails into his forehead or tear his fingers till they bleed, without feeling pain.

But I need not further multiply instances. They all possess the same character—that is to say, they are spontaneously occurring non-perceptions of sensory impressions. We may explain them as a result of heightened tension of the brain elements in one place, and the consequent lowering of excitability in other regions. Consciousness is restricted, and sensory impressions which are not related to the special point upon which attention is riveted remain dissociated.

Such is the line of argument adopted by those who relate negative hallucinations with *rapport*, and regard the latter as the sum of the former, and the former as a symptom of the latter. So far as concerns the

[1] See Radestock, *op. cit.*, p. 231; Savage, *op. cit.*, p. 187.

negative phenomena we have just been considering, and some others which we shall presently cite, there is nothing of weight to be urged against this view. It seems to me, however, that it is incorrect to regard them as negative *hallucinations*. When we examine the examples brought forward and seek for their true explanation, we are inevitably forced to conclude that the processes concerned in them have absolutely no connection with hallucination. Even Wundt[1] says: "Assuredly we are not justified in regarding these phenomena, as they are so often regarded, and as the name implies, as processes which are related to hallucinations." Very true, for we should then have to regard the raising of the liminal level of consciousness, however brought about, even if due to the lowered susceptibility of the sensorium in sleep, as a negative hallucination process. Nay, if we pushed this view to its logical conclusion, we should have to consider as a negative hallucination the non-perception of sensory impressions resulting from a blow on the head with a bludgeon.

The mistake lies in supposing that the negative phenomena of *rapport*, which we have just been considering, and true negative hallucinations, which, as we shall proceed to show, are something quite different, involve the same processes, merely because they produce practically the same subjective results—viz., the non-perception of sensory impressions.

I have spoken hitherto only of the negative phenomena which occur spontaneously in hypnosis as a feature of *rapport*. There are others, however, due to

[1] Wundt, *op. cit.*, pp. 64-66.

direct suggestion, and, again, others which accompany positive hallucinations. These last may perhaps be explained in the manner already described. It is at least a tenable assumption when a positive hallucination is associated with a negative one, when the object "covered" by the hallucinatory image is not seen, that owing to the fixation of attention on the positive sensory deception, all objective sensory excitations necessarily remain below the threshold of consciousness. To quote a case: suppose the suggestion is given that there is a green folding screen in the middle of the room, where in reality there is nothing, and that it is then found that the part of the wall hidden by the imaginary screen, the engravings hanging on it, the persons passing between it and the screen, and so forth, are no longer seen, whilst all other persons and objects in the room are perceived as long as they do not trench on the section of the visual field covered by the screen. In this case the non-perception may be explained quite simply as a diversion of attention, which is to say that in obedience, possibly even unconscious obedience, to a certain sign, which may be a visual impression or the muscular sensation accompanying a particular movement of the head and eyes, the subject's gaze is concentrated on the place occupied by the imaginary screen, this being recognised by certain *points de repère.*

True Negative Hallucinations.—But this theory falls to the ground when we seek to explain by it the process which takes place when an object simply disappears. Suppose I show A., who is hypnotised, a wine-glass which is standing on the table before him, and tell him that it will vanish on a certain signal being given. *I do not divert his*

attention from the glass; on the contrary, I direct his attention to it, and in still higher degree, since he is hypnotised, than if I gave him the assurance in the waking state. In any case it would be very far fetched to suppose that A., on being told that the glass would disappear when I made a clicking sound with my nails, should understand and develop the suggestion in the sense that on the signal being given he was to notice everything else in the room, but not to notice the glass. *The idea actually called forth by my words would be "the disappearance of this glass."*

The brain process which accompanies the idea of the invisibility of the glass depends in each individual, and in each separate experiment, on the activity of ever-varying elements, some of which are excited by momentary sensory stimuli from the surroundings of the glass, whilst others become active through association, according to the past experience and mental habits of the subject. Since the co-operation of these latter factors has been rendered possible only by the action of positive influences, it may be said, though the expression is no doubt more popular than psychologically correct, that such a "negative" image is constituted from the combination of a number of "positive" images. The wide scope which the suggestion of a negative hallucination leaves for individual development places it in the same category with the suggestions which are couched in vague terms, and given without details (as in the cases of suggested lameness quoted above). A negative suggestion is, in fact, nothing but an extremely vague positive suggestion clothed in negative form. The suggestion, "This glass is no longer visible," is just as much a command to see something else as the

suggestion, "You cannot walk properly," is an invitation to represent some kind of lameness. As with any other vague suggestion, each subject will interpret the suggested negative hallucination in a characteristic manner. In one case the bare surface of the table, in another the uninterrupted pattern of the wall-paper; in a third, perhaps a curdling mist occupying the place of the glass supplies the chief feature of the negative hallucination—"the non-perception of this glass." In many subjects, however, the response to the command does not take the form of a hallucination at all, but of a conviction that they have been forbidden to look at the glass. I observed lately in a series of cases that upon the command, "You are not to see X.," the hypnotised subjects *looked away* from the person indicated. If told to look about them they obeyed, but always avoided looking point-blank at X., and would glance up or down whenever his figure was about to come into the field of vision.[1] A state which Bernheim has proposed to call "psychic blindness"[2] occurs in response to the vague suggestion "not to see," and is expressed in the most various ways, now by the hallucination of a curdling grey mist, and again perhaps by the reproduction of the effect caused by shutting the eyes or entering a dark room, and so on (see, above, the explanation of the disappearance of visual phantoms on closing the eyes, an act which suggests the disappearance of visual images). It is therefore clear

[1] Only on a superficial view can such cases be attributed to *oversight* through inattention. Careful observation soon shows in the majority of cases that there is a positive, energetic averting of the gaze from X., or an anxious endeavour not to catch sight of him.

[2] (Not soul-blindness), Bernheim, *De la Suggestion*, etc.

that there is a fundamental distinction between the content of consciousness in a subject rendered "psychically blind" by a negative suggestion, and, in one whose consciousness is diverted into a particular channel, who absorbed in an auditory hallucination, for instance, becomes insensible to impressions of light. In the latter case visual sensation forms no part of consciousness, but in the former a visual sensation, subjective, of course, and differing in different individuals, is included in the content of consciousness. "Psychic blindness," says Bernheim,[1] whose term is here more correct than his theory, "is the blindness which comes through imagination. It is due to the destruction of the image through psychical activity," and not, be it added, through diversion of psychical activity.

It might of course be objected that the negative character of the hallucination is the mere result of the restriction of consciousness to the positive phenomena which accompany it, that in the last resort non-perception itself is only the diversion of attention. Such would seem to be Wundt's[2] view, since he says—

"I think we must here assume that the idea that tactile sensations will no longer be experienced has the effect of a positive diversion of the consciousness to other sensory impressions, if only to the acoustic images corresponding to the words, 'Your skin is no longer sensitive.' I find approximations to this in the normal state. There is a well-known psychical device for lessening the pain of an operation, the extraction of a tooth, for example, which consists either in fixing one's attention on some other object, or in holding firmly to the thought, 'I feel no pain.' In my opinion the process is in these two cases one and the same."

[1] Bernheim, *ibid.* [2] Wundt, *op. cit.*, p. 65.

In reality, however, this view is founded on a misconception. Of course it is possible by fixing the attention on one subject to drive all other impressions out of the mind. But the true negative hallucinations which we have just described cannot be thus explained; for the positive hallucination is itself the hallucinatory non-perception of the external object, *and is in nowise to be regarded as something different from the negative hallucination, as something accompanying it.* The perception of a dark, formless mist, for instance, in the place of the glass, is for that particular subject the "non-perception," the "blindness." If a hypnotised subject is taken to a cross-road and there told not to go on, the negative idea of motion instilled into him will, it is true, be realised for the bystanders in a positive action; but the standing still of A., B.'s turning to the right, C.'s wheeling to the left, D.'s marking time, and E.'s walking backwards, are not merely something which accompanies "the not going on," but are in fact "the not going on" itself. For the same reason it is incorrect to speak of a positive sensory delusion as "combined" or "associated with" a negative one, though the expression is often used, and I have myself employed it before my own view had been fully developed. When the delusion that he is in a dungeon is suggested to a hypnotic subject, and all his sense-impressions are coloured by it, so that the papered wall of the room becomes for him a damp dungeon wall, then the perception "dungeon wall" is identical with the non-perception of the wall-paper; or, to turn to our former illustration, the perception of a green screen in a certain place, localised by cutaneous sensibility, eye accommoda-

tion, etc., is one and the same with the non-perception of the persons passing behind it.[1]

Moll raises another objection. He points[2] to those negative hallucinations which vanish the moment the attention is drawn to the invisible object.

"We can see clearly in such cases that the negative hallucination is caused by the diversion of the attention from the object, and that the direction of the attention to it is a counter-suggestion. I say to a subject, 'When you wake, X. will have gone away.' When he wakes, and is asked how many people are present, he says 'Two; you and I.' I then point out X., and tell the subject to look at him. Thereupon he sees X., and the suggestion has lost its effect."

In my opinion Moll himself gives the right explanation of the phenomenon in the words, "the direction of the attention is a counter-suggestion." At least I have never seen a case where X. became visible if every suggestion which might arouse the idea of seeing him again was carefully excluded. I invariably succeeded in turning the subject's attention to the place where X. stood without destroying the negative hallucination.

We are therefore led to conclude from all these

[1] By demonstrating the impossibility of separating the positive and negative sides of a hallucination, the theory here briefly indicated disposes of Moll's contention that no valid objection can be urged against his view of the part played in negative hallucinations by diversion of attention. Of course non-perception through oversight may be induced by skilful suggestion, or by auto-suggestive development of a command, for instance, if the subject concentrates his entire attention on the *search* for the vanished object; but this would be, like the efforts not to see X. in the case given above, only an individual interpretation of a vaguely expressed suggestion, which had not produced a hallucination but an overmastering inclination, and the acting out of that inclination. If, however, a hallucination is produced, then, as we have stated above, diversion of attention can no longer be considered as a specific element to which a part can be assigned or denied.

[2] Moll, *Hypnotism* (fourth English edition), p. 255.

considerations that negative hallucinations, in contradistinction to the negative phenomena of *rapport*, which have a dissociative character, are conditioned by cerebrostatic enforced association—that is to say, that they are true hallucinations in every sense, and the only negative thing about them is the verbal form of the suggestion.

Experiment confirms this conclusion. The anomalous results obtained in certain cases are not to be explained by diversion of attention, but force us to assume that the effect of the suggestion is to associate with a particular sensory impression the activity of certain element-groups which correspond to the idea of the non-perception of a certain object. W. James[1] states that when the subject had been made blind to a certain pencil line by suggestion he would sometimes regain his sight of it when it was combined with other lines into a figure, a face, or some such object. The following case of my own forms a good counterpart to the experiment in which the coins taken out of an "invisible" purse[2] proved also invisible to the subject, and serves to show how these anomalies of suggestion may be elucidated from the present standpoint.

S——, a village lad aged eighteen, was hypnotised by the Nancy method. His capacity for negative hallucinations was soon established, for upon suggestion several persons became invisible to him both during and after the hypnotic trance, even though their efforts to attract his attention were not of the mildest description, and although ordinarily these very individuals possessed great authority over him. A Swedish match with a brown head was then shown to S——, the white end having first been charred a little on one side. It was then

[1] W. James, *Princ. of Psych.*, ii. p. 608.

[2] Binet and Féré, *Animal Magnetism*, p. 308.

suggested that the match was lost, that he could not see it, and so on. The experiment proceeded in the usual way, with the result that S—— remained blind to the match when the *point de repère* was visible to him, but saw the match when the *point de repère* was hidden.

In the middle of this experiment two matches were shown to S—— in such a way that he could only see the brown heads and a part of the white wood. According to the rule he should have seen two matches, but to the usual question, "How many matches do I now hold?" he replied, "None."

This experiment, as well as some others which followed it and yielded similar results (unfortunately symptoms of "training" soon appeared in the case of S——), seems to contradict the rule. This contradiction disappears, however, if we assume that S—— mistook the heads of the matches, that is to say, the brownish-black visual impression emanating from them, for the brownish-black *point de repère*. But the most interesting thing is that he transferred the non-perception of one match to several, indifferently, whether one, two, or six matches were presented to him. It is noteworthy also that on the first occasion of the transference of the negative impression from one match to several the answer to the question was noticeably long in coming, a circumstance which manifestly depends on the fact that the non-perception in this case did not, as in the preceding instances, take place automatically, but was constructive in character.[1]

[1] W. James, *op. cit.*, ii. p. 607, gives another curious case where the person whom the subject was not to see still remained visible, but appeared as a stranger. It should be noted that just as the spontaneous negative phenomena of *rapport* have been mistakenly classed with negative hallucinations, so the spontaneous amnesia of somnambulism has been confused with amnesia induced by suggestion.' In reality the same kind of difference exists in both cases.

CHAPTER VII.

THE INITIATION OF FALLACIOUS PERCEPTION.

The Problem: How are Reflex Hallucinations to be accounted for?—(1) Synæsthesia, (2) Hallucinations of Memory, as possible explanations—Author's attempt to explain them by distinguishing between the preparatory and the starting Factor—A New Conception of the Point de Repère.

The Problem.—The dependence of hallucinations on sensory stimuli has been more or less indicated by previous writers, especially in treating of dreams. But they have for the most part contented themselves with referring the perception to some definite stimulus, and explaining the particular form of the dream by individual reaction. Consequently no serious attempt has been made to elucidate the problem with which I now propose to deal. How comes it, we must ask, that sensory stimulation of one sense may produce a hallucinatory response in another, that, for instance, the temperature sensation experienced by a sleeper when the bed-clothes slip off may give rise to a visual hallucination of icebergs and polar bears; or again, that a verbal suggestion given to a hypnotic subject may induce the temperature hallucination of touching red-hot iron?

Synæsthesia.—In the first place, we might answer

this question by assuming that the effect of a stimulus on one sense may, under certain conditions, penetrate into other sensory regions, reaching by some means or other beyond the elements first affected, and arousing alien element-groups in a second sense.

This view has received some experimental support, and has been adopted, among others, by Jolly on the strength of his own observations. Thus he found in one case that electrical stimulation of the fifth nerve produced not only subjective sounds, but full-fledged auditory hallucinations, which did not correspond to the opening and closing of the current, but appeared under all conditions in which pain was produced.[1] Chvosteck,[2] however, opposes this conclusion, and thinks the flow through the trigeminus less probable than that the auditory nerve was directly affected by the strength of the current. For though he obtained like results in a similar series of experiments, these only occurred under galvanism; other excitations—pricking, pinching, etc.—failed to produce any auditory sensations whatsoever.[3] Again, Higier, *op. cit.*, quotes a case of Hutchinson's where a totally blind patient experienced visual hallucinations as a result of irritation of the cornea due to inflammation. He also cites two cases of Féré's where visual hallucinations occurred, in the one case in association with neuralgia of the optic nerve, and in the other with neuralgia of the trigeminus. These cases, he thinks,

[1] Jolly, *Arch. f. Psych.*, iv.

[2] Chvosteck, *Jahrb. f. Psych.*, xi. 3.

[3] Binet's experiments are also interesting, "Recherches sur les Altérations de la Conscience chez les Hystériques," *Rev. Phil.*, xxvii. p. 165. Hemianæsthetic hysterics were secretly pricked with a needle on their insensitive region. The prick was not felt, but the subject saw at the same moment a light or dark spot.

must be explained in the way indicated. It seems to me, however, that the explanation of the last two cases suggested on page 175, Note 1, covers the facts more easily and satisfactorily. So much as to the experimental evidence, which, it must be owned, is of a somewhat ambiguous character. It is, however, upon the phenomenon of synæsthesia, to which much attention has recently been directed, that this theory chiefly depends for support.

Synæsthesia, that is to say constant involuntary association of a certain image or (subjective) sensory impression with an actual sensation belonging to another sense, is observed in a variety of forms. Thus a particular taste may call up the image or sensation of a particular colour (taste-photism, taste-chromatism). There are also chromatisms of smell, temperature, muscular resistance, etc.; or again, the sight of a particular colour may be associated with the "subjective" perception of each definite musical sound or "clang" (light-phonism). The most conspicuous member of the whole group of synæsthesiæ is *audition colorée*, or sound-seeing—that is to say, the peremptory association of a definite "subjective" colour sensation with the hearing of an actual sound. I therefore propose to consider it in some detail.

The special colour sensations associated with particular "clangs" always remain constant in the same individual, but the relation is purely individual and not referable to any general law. That is to say that whilst one person on hearing the vowel *a* always sees white, for another the colour invariably associated with this vowel may be light blue. *O* is often associated with black; indeed, deep tones and vowel-sounds seem generally to be associated with dark,

and sharp, high-sounding vowels with the lighter colour sensations. The kind of sound which produces these colour sensations also varies in different individuals. In one case they may be related to the vowel-sounds, in another to the *timbre* of the speaker's voice. In some cases the tones of various musical instruments are associated with definite colour sensations. The degree of externality with which the chromatisms appear also varies very much; they may consist in the mere spontaneous mental association of a certain colour with a certain sound, or they may occur as fully-developed objective sensations. I select the following interesting case from the account of his experiments given by Professor Gruber, of Jassy, at the London International Congress of Experimental Psychology. The subject was a Roumanian friend of Professor Gruber's, whom he describes as a man of exceptional endowments—a gifted scholar, antiquarian, etc.—with a mind peculiarly well qualified for the task of self-observation.[1]

"Whilst I repeated the vowels slowly and distinctly my subject assumed an attitude of *expectant attention*, and pictured them to himself in his own handwriting as I uttered them—*a*, bright white; *e*, bright yellow; *i*, bright blue; *o*, deep black; *u*, faded black; and the two other vowel-sounds peculiar to the Roumanian language, *ä* and *î*, brown and blackish-grey respectively. The same with the consonants, but on hearing these he perceived two colours, one belonging to the consonant itself and the other to the vowel which occurs in its name. For instance, on hearing *F* [*ef*] he saw the letter written in scarlet with a narrow band of orange colour on the left side . . . the orange colour was formed by

[1] *International Congress of Experimental Psychology*, Second Session, London, 1892, pp. 10 *et seq.*

the blending of the bright yellow of the *e* with the scarlet of the *f*. If I reversed the pronunciation of the letter and called it 'fé,' then the orange-coloured streak appeared on the right side. I found it possible to isolate the special colour of the consonants. To accomplish this it was necessary that the subject should not hear the name-sound of the consonant, but should try to picture the written letter vividly and at the same time to suppress its sound-image.

"The diphthongs, triphthongs, syllables, and substantives—that is to say, the '*phonetic chromatisms*' of spoken language—appeared as horizontal bands of colour consisting of vertical stripes. These stripes, or '*amplitudes*,' corresponded to the sound of the words. The diphthongs, of which the Roumanian language possesses twenty-three, exhibited very remarkable characteristics. We found that the bands corresponding to these diphthongs were all of the same length (70 millimetres), and also of the same height (35 mm.). Thus the form of the chromatism corresponding to a diphthong was proved to be that of a rectangle formed by two squares of 35 mm. placed side by side. (I shall explain immediately how we obtained these measurements.) The length of the stripes, or 'amplitudes,' on the other hand, was not the same for all diphthongs. According to the variations of the amplitudes we were able to distinguish five classes, and these classes corresponded to the five natural philological classes of diphthongs in the Roumanian language.[1] I succeeded by objective measurements in establishing the following law in the case of this subject: *while the length of the amplitudes varies according to the class to which the diphthong belongs, their sum remains constant.*

"The chromatisms which we found to correspond to numbers were not rectangles, but circles and ellipses. But first let me describe the objective method I employed to measure the various chromatisms. Let us take the example with which we started. The number *doî* (two) is for my subject a chroma-

[1] Ebers states that Lepsius, the Egyptologist, used his chromatisms as a guide in his philological inquiries, and Galton (*Inquiries into Human Faculty*) gives the case of a lady who found the colours associated with the letters a great help to her in spelling certain words.

tism of a pure bright yellow, deeper towards the middle, somewhat fainter towards the edge, but clearly defined by a circular outline. My subject has the power of externalising his chromatisms; he projects them, for instance, upon the opposite wall, at no matter what distance. I chose for our experiments a distance of three metres, which is that at which his vision is most distinct. I then cut out a disc of white paper, which I supposed to be about the same size as his chromatism of the number *doĭ*, and surrounded it with bright red. The subject then projected his chromatism into the white disc, but the disc proved to be smaller than his chromatism, for he saw a circle of orange caused by the superposition of its subjective yellow on the objective scarlet. I enlarged the disc. This time he saw a white ring between the objective scarlet and the subjective yellow. The paper disc was now too large, so we continued experimenting till we got the edges of the chromatism to touch precisely the edges of the white disc. We were thus able to judge of the shape of the chromatisms, and could measure them to a millimetre. . . . In a long series of experiments we determined, by this empirical method, the exact size and form of all the chromatisms of numbers and diphthongs. No matter how often we repeated the experiments, the results were always the same. If the experiments with the diphthongs had yielded remarkable results, in the case of the numbers a still greater surprise was in store for us.

"As before, we took two dimensions, height and length, or vertical and horizontal diameter, but in this case we found that the vertical diameter depended on the number of syllables in the name. For instance, the monosyllable *doĭ* had a vertical diameter of 21 mm., equal to the horizontal diameter, but the dissyllable *patru* (four) a vertical diameter of 22 mm., while its horizontal diameter remained at 21; and *patru-zecĭ çi patru* (forty-four) had a vertical diameter of 26 mm. Thus we found that with every added syllable the vertical diameter increased by a millimetre. Innumerable control-experiments of every sort yielded the same result. The horizontal diameter, on the other hand, corresponded to the class to which the number belonged—that is to say, to the units, tens, or hundreds, etc., and remained the same for all the numbers of the same class. For example, 100 and 999 exhibited the same horizontal

diameter. The following is a table of the horizontal diameters of the chromatisms :—

Units	21 mm.	Thousands	30 mm.
Tens	23 ,,	Tens of thousands	35 ,,
Hundreds	26 ,,	Hundreds of thousands	41 ,, etc.

"In comparing these numbers, which we had obtained quite empirically, we found that they followed a very simple rule. *The difference in the horizontal diameters between class and class corresponded to the series of the natural numbers*, thus :—

Diameters:	21	23	26	30	35	41	48	56	65	75
Differences:		2	3	4	5	6	7	8	9	10

"But what astonished us most of all was the fact that both the 'phonetic' element (which grew vertically) and the arithmetical or psychical element (which grew horizontally) increased by the same unit, a millimetre."

These observations, which of course only hold good of this particular subject, in that they indicate highly complex subconscious processes capable of achieving results impossible to the normal consciousness, testify at least to the genuineness of the phenomena.[1]

The question now to be considered is whether in such a case we have to deal with real double-sensations, or only with phenomena of association. Even Myers[2] considers it more probable that slight cases

[1] It is of course difficult to say how far such a scheme may or may not depend on unconscious and unintentional suggestion on the part of the observers acting on the neuropathic constitution of the subject. (See *Congrès internat. de Psychologie physiologique*, Paris, p. 96.) Compare the case in Ziehen's *Psychiatrie*, p. 19, where the phenomenon is apparently due to an association of addition. For instance, the percipient saw the sum of two numbers, for which his respective chromatisms were red and yellow, as orange coloured. The results, however, of other observations with the same patient, which have been kindly furnished to me, do not support this view.

[2] *Proceed. of the S.P.R.*, 1892, p. 457; Dessoir, *Arch. f. Physiol. und Anat.*, 1892.

are to be ascribed to association, due for the most part to infantile experience working upon an innate predisposition. But in cases where the phenomena are found in fuller development he considers that there is real synæsthesia, an actual irradiation of sensitivity into the sphere of a second sense, and he points, in support of his view, to the many forms in which these reflexes have been found to occur,[1] and the abnormal precision and inevitableness with which they act, and, further, to the ascertained fact that only a very small percentage of persons can remember when their "photisms" or "chromatisms" began.[2] S. Epstein[3] draws a distinction between cortical phenomena and phenomena which, according to him, originate somewhat in the following manner :—

> Only a small proportion of the bundle of nerve fibres which carry sound sensations reach the cortex; the greater number branch off sooner, forming a regular network of axis-cylinder prolongations, which extend into the anterior corpora quadrigemina and there terminate. These axis-cylinder prolongations are connected first with the trochlear, oculomotor, and abducens nerves; secondly, with the fibres of the optic nerve proceeding from the superior part of the corp. quad. In accordance with these anatomical indications a small part only of the excitation started by the acoustic stimulus would be directed to the cortex, while the rest reaching the corp. quad. would exert a reflex centrifugal action through the fibres of the optic nerve on the retina.

[1] A case is described in the *Revue de l'Hypnotisme*, December 1892, p. 185, where a man who had long exhibited *audition colorée* developed *gustation colorée* in addition, when in a low state of health.

[2] It appears from Prof. Flournoy's *Enquête sur l'audition colorée* that among 213 persons presenting synæsthesia only 48 could assign a date to the origin of these associations.

[3] A lecture delivered before the third International Congress of Physiology at Berne, 1895.

The question whether the phenomena are to be regarded as pathological or physiological has been variously answered. The pathological view is advanced by Neiglick and Steinbrügge, Féré postulates a "tonalité particulière de l'organisme,"[1] while Perroud, Chabalier, and Urbantschitsch consider the phenomena as physiological. Urbantschitsch founds his view on the results of his own experiments. He succeeded through excitations of the senses of smell and taste in arousing reflex sensations in other senses in the great majority of his subjects,[2] but observed that notwithstanding the frequency with which they were manifested, a combination of favourable circumstances was, as a rule, required to evoke them. Consequently he considers that the remarkable thing about these synæsthesiæ is not their mere occurrence, but the great vividness which they assume in some cases, and the fixed character of the associations. In any case, it seems probable that heredity plays a part, since whole families are occasionally found to possess this faculty, though the nature of the associated sensations differs in different members.

Too little is yet known of the subject, however, to justify us in explaining hallucinations as "synæsthesiæ"; pending further inquiry, we must rather regard synæsthesiæ as hallucinations whose regular recurrence and fixed character point to an automatic association acquired very early in life.[3]

[1] Compare also the remarks in the report of the *Congrès International de Psychol. Physiol.*, Paris, 1890, pp. 94-96.

[2] From the results of Fechner's inquiry it would appear that about a fourth of the persons answering are subject to synæsthesia.

[3] For literature see Nussbaumer, "Ueber subjective Farbenempfindungen, die durch objective Gehörsempfindungen erzeugt werden," *Wien. med. Wochenschr.*, xxiii. (1873), p. 123; Bleuler und Lehmann,

Hallucination of Memory as a possible Explanation.—Again, we might answer the question in another way, by assuming that no hallucination in a second sense really takes place at all; that in the case we have used to illustrate this point there may have been no actual *visual* hallucination of polar bears and icebergs, but only an extremely complex perception of the stimulation of the temperature sense caused by the slipping off of the bed-clothes. Thus the cold would be perceived as "the cold felt on seeing polar bears and icebergs," and the complex would be split up in the memory into parts separated in time. The possibility of such an explanation has already been

Zwangsmässige Lichtempfindung durch Schall u. verwandte Erscheinungen, etc. (1881); J. Stinde, *Farbige Töne und tönende Farben* (1885); Steinbrügge, *Ueber secundäre Sinnesempfindungen* (1887); Urbantschitsch, *Arch. f. Physiol.*, xlii. (1888), p. 154; Krohn, "Pseudo-chromaesthesy," *Am. Journ. of Psychology*, v.; Binet, "L'audition colorée," *Rev. d. Deux Mondes* (1 Oct. 1892); F. Suarez de Mendoza, *L'audition colorée* (1892). Such a case as the following, described by Arndt, cannot be classed here:—"A patient suffering from hernia experienced auditory hallucinations which he believed to be independent and primary. But observation showed that they varied with the disease, becoming more violent as it become acute, and ceasing altogether when Herr A. succeeded in reducing the rupture permanently." Hoppe explains this correctly as a reflex psychosis with hallucinations, not as direct reflex hallucinations. Nor can the following case, reported by F. de Rause, *Gaz. d. Paris* (1871), 33, be classed as such. In a gun-shot wound in the lungs the ball had entered just below the spina scapulæ and come out in the first intercostal space. Every time that lactic acid diluted with water was injected into the anterior wound gustatory sensations were experienced. The patient could recognise the taste of the liquids injected—of tea, for instance—and could even tell whether the mixture was strong or weak. When the liquid was injected into the posterior wound the experiment did not succeed. Chassinat, *Gaz. d. Paris* (1871), 35, reports a similar case.

indicated above, but it would be no easy matter to find unequivocal proofs of its general applicability. Moreover, the difficulties admit of another explanation.

A Third Hypothesis.—This third hypothesis allows us to suppose that a visual hallucination indeed takes place, but that the temperature stimulus is not to be regarded as the *starting* factor. The change of temperature co-operates with many other circumstances to bring about the required state of heightened tension in a particular element complex, and thus directs to it the irradiation of processes initiated otherwise by stimulation of the visual sense. It only prepares the way for the hallucination, it exerts only a suggestive influence on its content. To use a metaphor, it lifts the lid from a powder-cask, so that a falling spark explodes this particular cask and not one of the others which remain closed.

But the initiation of the hallucination by a visual stimulus is not to be conceived of in Binet's sense, that is if I rightly understand him. From the results of his experiments in co-operation with Féré—*e.g.*, from the doubling of the imaginary object by the prism, and its reflection in a mirror—Binet was led to conclude that the hallucination is always attached to a certain sensation derived from a real external source.[1] He maintains that a sensory nucleus for the hallucination is in each case furnished by some special object (*point de repère*), which becomes completely overgrown and obscured by the hallucinatory super-

[1] Moll, *Hypnotism*, p. 104, mentions the similar results obtained by Jendrássik: "If a *d* is drawn with the finger on a sheet of white paper, and it is suggested that the *d* is real, the subject sees the *d*. If the paper is turned upside down he sees *p*, and in the looking-glass *q*."

structure; some minute black speck, for instance, upon a card may, according to him, furnish the *point de repère* for a hallucinatory picture projected upon it, and when the object to which the hallucination is attached is doubled by a prism, enlarged by a magnifying-glass, or reflected in a mirror, the sensory stimuli proceeding from it become the nucleus of a hallucination, which is in like manner doubled, enlarged, or reflected.

But it has been proved by other observers that hallucinations do not always follow optical laws.[1] Further, we may ask, with Gurney,[2] how the hallucination can be explained when it appears in free space where no special points of external excitation can possibly be connected with it; for instance, if the phantasm of a woman's form appears immediately in front of me, and my eyes are firmly riveted to it, that is to say, are focussed on a point in clear space where there is nothing objective to be seen? A mark on the wall of the room some distance behind the figure can hardly be supposed to form the nucleus of the hallucination in this case, since to see the wall would require a very different adjustment of the eyes. Besides, how is it in any case conceivable that a point of external excitation situated in one place could act as the *point de repère* of a hallucination appearing elsewhere? New difficulties arise when we seek to explain phantasms appearing in the dark, and

[1] Compare James, *Principles of Psychol.*, ii. p. 130. Bernheim, *De la Suggestion*, etc., pp. 101-105, seems to me to have firmly established the suggestive origin of the whole series of phenomena. The real nature of the *point de repère* is well brought out in Dixey's experiments, and also in those of Mrs. Sidgwick (Report, pp. 108, 109).

[2] Gurney, *op. cit.*

still more when we attempt to account for *moving* hallucinations on this theory. In the latter case, for instance, the *point de repère* cannot follow the phantasm, and we should have to suppose that the percipient attaches his hallucination in turn to all the objects in front of which it glides. Again, how would M. Binet explain the behaviour of an apparition which came directly towards the percipient; for instance, the phantasm of a bird flying towards him—a form of hallucination in connection with which convergence of the eyes has been observed? Is it possible to conceive that the phantasm can detach itself from its *point de repère*, from what is supposed to be its sensory nucleus, and flutter about in free space without losing its sensory character?

All these difficulties disappear, however, if we assume that the sensory character of a fallacious perception originates, not in one specific sensory stimulus, but in the general fact that the nerve-tract of the sense affected is at work; that instreaming currents from the periphery discharge the elements of the "hallucinated" centre in the same way as in normal perception. For just as we cannot say that an act of perception is altered, by the introduction of a new object into the field of vision, into a new act of perception which is the sum of the former plus the perception of the object, no more can we speak of a hallucination—the hallucination of a white figure, for example—as though it were a separable part, capable of being subtracted from or added to some percept,—"a room with a white figure in it," for example. In neither case can we refer a part of the perception to one particular sensory stimulus. The most that we can say is that the sum of the sensory stimuli has a

certain effect on the brain-state which obtains at the moment, and that the cerebral process which is brought about by both these factors is accompanied by an act of perception, which is either "objective," *i.e.*, can be shared by all individuals alike, or "subjective," *i.e.*, a fallacious perception.

A view somewhat similar to the one presented here in physiological terms has been expressed by Volkmann von Volkmar[1] in terms of psychology. It is true he employs the old distinction between illusions and hallucinations, but he points nevertheless to an intermediate class of phenomena to which it seems to me his "hallucinations" ought in the last analysis to be referred.

"Not seldom, indeed, we encounter cases where between the sensation and the projection (or localisation) a reproductive element intervenes, so that whilst the sensation still furnishes the occasion for the projection, this latter is eked out and completed by the reproductive image. The sensation endows the mental image with objective vividness, and the image adopts the nameless sensation and gives it a name. The sensation starts the projection, but the completed projection represents the sum of sensation and image. This somewhat complex form of sensory deception resembles an illusion in having a sensory basis, and a hallucination in the projection of a mental image. It may therefore be said to begin as an illusion and end as a hallucination, and may be regarded in two ways, according as the sensory or the representative element predominates in the projection. In false perceptions of the former sort[2] the mental image insinuates itself unremarked into the sensation, which it modifies without destroying

[1] Volkmann von Volkmar, *Lehrbuch d. Psychol.* (4th ed.), ii. pp. 147 *et seq.* I quote the passage, but without committing myself to the author's psychological standpoint.

[2] We are reminded here of the numerous examples cited by Helmholtz to prove that the position, surroundings, and form of an object all help to determine its colour.

its sensory character; in those of the latter sort the sensation flows side by side with the transforming process, and only serves to give the mental image the tone and appearance of a sensation. It should be noted, moreover, that on the other side true hallucinations are related to this class of sensory deceptions because, though initiated by the reproductive element alone, a sensation never fails to accompany them sooner or later."

In any case this theory seems best to cover all the facts, since, while it refers the sensory character of the hallucination to the participation of the sensory nerves, it explains the content of the hallucination by reference to the specific processes started by the sensory stimuli in connection with the cerebrostatic condition present at the time. On this view Binet's *point de repère* resolves itself into a purely suggestive factor, which assists in two ways in the result. In the first place, by stimulating the element-groups (whose activity conditions the false-perception) associated with it through suggestion or self-suggestion, and placing them in the required state of heightened tension, it prepares the way for the hallucination; in the second place, it frequently serves to localise the phantasm. By including under his term each and every sensory impression which by acting as a mental cue may prepare the way for a hallucination we are really enlarging the scope of Binet's theory. Thus when a visual hallucination is suggested to a hypnotised subject, a clicking sound made with the finger-nails, or the muscular feeling corresponding to a certain movement of the head and eyes, or the touch of the hypnotist's hand, may serve as a *point de repère*.

CHAPTER VIII.

THE MANIFESTATIONS OF FALLACIOUS PERCEPTION.

Various Degrees of Distinctness in Sensory Phantasms.—Percipient's Attitude—Sensory Character of the Phenomena not disproved by a certain feeling of Subjectivity—Attempts to explain "Audible Thinking"—Automatic Articulation—Spontaneous Cases—Experimental Evidence.

IN the preceding chapter I have endeavoured to trace the origin of the sensory quality in false perception. I shall now proceed to consider its manifestations—*i.e.*, the various forms of externalisation of the hallucinatory percepts. If we consider first the *distinctness* of the percept we shall find that this is not always uniform. From the accounts we can clearly recognise a gradation. Sometimes the hallucinations seem to be scarcely distinguishable from vivid mental images; or, again, they may be externalised to such a degree as to differ in no particular from the ordinary correct perception of plainly recognised objects. Between these two extremes, of course, there are countless delicate gradations, of which the most important must be discussed here.[1]

But first let me advert briefly to Wundt's[2] remark

[1] Cf. for these discussions, Report, pp. 70-133.

[2] Wundt, *Grundzüge der physiologischen Psychologie.* On the other hand, Friedmann (*Ueber den Wahn*) says of illusions that they are somewhat wanting in plasticity.

—an irrelevant one, certainly, according to my view of the matter,—that complex visions are usually described as much more vague and evanescent in character than illusions (in Esquirol's sense) to which the external point of attachment gives "an element of fixity."[1] But the fact that detailed, fully developed phantasms are often less clearly described has nothing to do with their distinctness in themselves, but must be accounted for by the confusion of mind which obtains in many morbid conditions (*e.g.*, in fever delirium), as also in dreams and drowsy, half-asleep states. On the contrary, the greater distinctness of the more complex, and consequently rarer,[2] type of phantasm is indicated first by the circumstance that the English census gives more cases of complex than of simple hallucination (showing that the former are better remembered), and secondly, by the comparative frequency with which they affect several senses at once.[3]

The gradations of distinctness above referred to yield different images according to the sense affected.

[1] Wundt, taking his stand on the ground of the centrifugal theory, does not pay sufficient attention to the psychological differences of quality which exists between a mental image, however vivid, and all illusions of the senses—even if their perceptibility to the senses should only arise from a higher degree of the accompanying physiological process.

[2] Rarer, because corresponding to the discharge of less extensive complexes of elements. In hypnotised persons, too, the hallucinations are more rarely complex. A man who has the hallucination of a glass of red wine need not, in addition to visual hallucination, experience also the hallucination of the feelings corresponding to the weight, temperature, etc., of the glass.

[3] If we reckon among simple phenomena those cases which, as sensations of light, sound, touch, remain entirely dissociated, or in which the appearance, though realistically perceived, was not recognised as this or that concrete person, and the other reported cases

Degrees of Distinctness in Auditory, Painful, Olfactory, and Gustatory Hallucinations.—In auditory delusions the lowest degree is represented by the "psychic" hallucinations of Baillarger. These are "soundless" internal voices, which seem to the subject to be addressed to him from outside; they are spoken of by the insane as "spiritual," or as "soul-language."[1] By their soundlessness they are clearly distinguished from more highly externalised acousmata, where the "sound" element is more or less strongly marked, the voices sometimes seeming to whisper softly in the ear, or to be heard faintly from a great distance, and in other cases sounding loud and distinct. Hallucinatory (non-

as complex, the figures, according to the English tables, will stand as follows:—

	Total.	Simple Hallucinations.			Percentage of Simple Hallucinations.
		Unknown Persons.	Indistinct	Total.	
Hallucinations of one sense ...	1619	572	190	762	*circa* 47
Hallucinations of more than one sense	251	49	28	77	*circa* 31

So that, in hallucinations affecting more than one sense, we find complex phantasms to be 16 per cent. more numerous. This figure, however, is certainly a good deal too low, if we take into consideration that among the forgotten experiences the majority must have been simple, and affecting one sense only.

[1] Griesinger, *op. cit.*, p. 102; cf. *Munich Collection*, xxiv. a. Louise Hansen, at Lübeck in 1871, sees the face of her mother, who was then dying at Hamburg. "I saw my mother in a grey cloud. The face looked out of the cloud; she made a request of me, and I answered yes, and at the same moment cloud and face vanished. The request was not made in articulate language, and as we speak, but by an exchange of thoughts, quite as clear and intelligible as though spoken aloud."

vocal) noises, such as the ringing of the door-bell, steps in the hall, or in the room itself, knocks at the door, etc., seem, as a rule, to be indistinguishable in intensity from corresponding objective sounds. Sometimes, in dreams, the hallucinatory noises are said to be loud enough to awaken the sleeper. In such cases, however, we are often concerned, not with hallucinations, but with external noises heard with abnormal intensity in a state of dissociation.[1] In other cases it may be subjective sensations which are hyperæsthetically perceived, for instance, certain attacks (not, of course, to be confounded with epileptic seizures), called by Weir Mitchell[2] "sensory shocks," which occur with alarming violence in neurasthenic and hysterical subjects, and after the excessive use of tobacco. On going to bed,—not on awaking,—and while going to sleep, a sudden shock is felt like a blow inside the head, in most cases accompanied by a sensation of sight, hearing, or smell so intense that these attacks, often preceded by an *aura*, are actually dreaded by those subject to them. This observation seems to confirm Hoppe's view, that the frequently reported subjective sensation of a loud crash or jar is to be taken as a symptom of fatigue. Here are two examples:—

[*Munich Collection*, xvii. 2, and xvi. 1.] "Fräulein R. Mei. . . ., an actress, reports: 'I thought I heard (on January 12th, 1888, in my apartments, between 11 A.M. and noon) a violent blow on the surface of the table at which I was sitting. Fräulein M. R., my maid, who was in the room, also heard it. We were not touching the table, and were both greatly startled by the sound. We examined the table, and found it

[1] See above, p. 117, Note 1.

[2] "Some Disorders of Sleep," in *American Journal of Medical Science*, vol. c., pp. 120-123.

quite intact. I was knitting a stocking and studying my part in a play. My maid was busy with household work. I was in perfectly good health and wide awake, yet was profoundly disturbed by the occurrence. Between 4 and 5 P.M. I received a telegram, informing me that my mother, who had been ill for some time,—in fact, I had been expecting to hear of her death for the last three weeks,—had died on the same day, between 11 and 12. I had not seen her for two years. My mother's last words were addressed to my brother, a lad of sixteen: 'Give my love to my R——, and always do as she tells you.'"

[*Munich Collection*, xvi. 1.] "At 31 Am . . . strasse, Munich, one day in February 1874, about 8 P.M., I distinctly heard a hand strike several violent blows on a piece of furniture standing in the room. My husband (who died in 1883) heard the same thing, and at once expressed his annoyance. The cook, too, who was just bringing in supper, heard the blows, and was frightened. My husband at once examined the piece of furniture, thinking that it had cracked. Nothing could be discovered, and no crack or other cause of the peculiar noise was to be found elsewhere in the rooms. I at once assumed that an aunt of mine, then in a dying state in the Pfalz, had in this way called our attention to herself. It turned out that this aunt had been thinking much of us, especially in connection with testamentary dispositions. She died soon after, in March 1874."

That hallucinations of pain often attain great vividness may be observed by every dentist, in patients who feel pain before the diseased tooth is even touched.[1] Moreover, the same thing is to be seen in hypnotism, where suggested burns and scalds cause the severest pain; nor are spontaneous cases, like that of Mrs. Severn,[2] so very rare. In this case the subject awoke with the feeling of having been struck and wounded on the mouth, sat up, pressed her

[1] Cf. the case of Bernheim (*Études Nouvelles*), where the hallucinatory pain was confined to a particular spot and represented an ulcer in the stomach.

[2] *Proceedings S.P.R.*, vol. ii. p. 128.

handkerchief to the spot, and was astonished to see no blood.[1]

Hallucinations of smell also vary in degree, as may easily be seen in post-hypnotic suggestion. Sometimes the subject is able to recognise the specific odour distinctly; sometimes, again, the sensation is vague and blurred. The same is the case with hallucinations of taste. Observations made during experiments in telepathy[2] show that, though the "transferred" sensation is frequently quite clear and distinct, so that the percipient can really indicate what he tastes, in other cases the taste experienced is much less definite. "It burns, and there is some sugar about it—just enough to soften it. It burns . . . you would feel it burning, I can tell you,"—this is the degree of accuracy with which the subject of a successful experiment in the telepathic transference of taste-sensations describes the taste of ground ginger, which the experimenter had in his mouth. Another time, when the agent had sugar in his mouth, the percipient thus describes his subjective taste-sensations: "It's getting better. Sweetish taste —sweet—something like sugar."

Degrees of Distinctness in Visual Hallucinations.—Gradations can best be recognised in cases of visual

[1] [*Munich Collection*, xv. 2.] "In the spring of 1889 I lay down one night between 10 and 11. I had put out the light, but was still awake; was not unwell; was just wondering how it was possible for some persons, whom I had seen, to fall so easily into a hypnotic condition. All at once I felt as if a cold hand had struck me in the face, at the same time I was conscious of pain. I could even feel the fingers. I was so much frightened that I did not venture to get up."

[2] Cf. *e.g. Proc. S.P.R.*, vol. i. pp. 226, 276; 1883-84, pp. 2-5, 8, 18-22, 205, 206.

hallucination, with which, therefore, I shall deal rather more in detail. The lowest degree of definite externalisation may be assumed, where the narrator uses such expressions as "I saw with my mind's eye," etc. The appearance is not a mere mental image, but neither is it perfectly externalised. The following narratives of waking hallucinations may serve as examples:—

Mr. Rawlinson writes:—"I was dressing one morning in December 1881, when a certain conviction came upon me that some one was in my dressing-room. On looking round, I saw no one; but then, instantaneously, in my mind's eye (I suppose), every feature of the face and form of my old friend, W. S——," etc.[1]

"In the convalescence[2] from a malarial fever, during which great hyperæsthesia of brain had obtained, but no hallucinations or false perceptions, I was sitting alone in my room, looking out of the window. My thoughts were of indifferent trivialities; after a time my mind seemed to become absolutely vacant; my eyes felt fixed, the air seemed to grow white. I could see objects about me, but it was a terrible effort of *will* to perceive anything. I then felt great and painful sense as of sympathy with some one suffering, who or where I did not know. After a little time I knew with whom, but how I knew I cannot tell, for it seemed some time after this knowledge of personality that I saw distinctly, in my brain, *not* before my eyes, a large, square room," . . . etc.

The narrator then points out that the natural order of perception was reversed—the emotion came first, then the feeling that a particular person was in question, and lastly, the vision or perception of the person.[3]

[1] *Proceedings S.P.R.*, 1884 (vol. ii.). p. 158. Cf. *Phantasms of the Living*, vol. i. p. 209.

[2] *Proc. American S.P.R.*, pp. 398 *sqq.* Cf. *Phantasms of the Living*, cases 21, 27, 38, 56; vol. i. pp. 196, 209, 235, 255.

[3] Cf. the case of unconscious hallucination already mentioned (p. 125), and the following observation of Janet's (*International Congress of Experimental Psychology*, Second Session, p. 165). "Many patients were tormented by fixed ideas. Some had full consciousness of those ideas, and openly stated what they were. Others could not well

In the next stage of visualisation the percipient sees a face or figure projected or depicted, as it were, on some convenient surface—the image being thus truly externalised, but in an unreal and unsubstantial fashion, and in a *bizarre* relation to the real objects among which it appears. In this respect it might be compared to the "after image" of the sun, or of some object that has been intently scrutinised through a microscope, which we involuntarily import into our view of the surrounding scene.[1] An excellent example of this kind of hallucination is the following :—

"My mother had not been very well, but there was nothing alarming in her state. I was suffering from a bad cold, and went to bed early one night, after leaving her in the drawing-room in excellent spirits and tolerably well. I slept unusually well, and when I awoke, the moon was shining through the old casement brightly into the room. The white curtains of my bed were drawn to protect me from the draught which came through the large window, and on this curtain, as if depicted there, I saw the figure of my mother—the face deadly pale, with blood flowing on the bed-clothes. For a moment I lay horror-stricken and unable to move or cry out; till, thinking it might be a dream or a delusion, I raised myself up in bed and touched the curtain. Still the appearance remained (although the curtain on which it was depicted moved to and fro when I touched it), as if reflected by a magic-lantern. In great terror I got up," . . . etc.[2]

describe them, and did not clearly know what it was which tormented them. Others had no notion of those fixed ideas, which provoked only states of emotion and impulses in them. For example, a young man had continual fear, without being able to explain what he was afraid of. It was sufficient to make him gaze on a shining surface for some time for him to see the flames of a fire; and after listening to a monotonous sound for some time he became aware of other sounds—those of the bugle of the fire-brigade; in a word, that process revealed the persistent idea of a fire which he had witnessed at some previous date."

[1] *Proc. S.P.R.*, vol. ii. p. 162. [2] *Ibid.*

Another example, perhaps somewhat more distinctly externalised,—although the image was certainly not so clearly defined as the other objects in the percipient's field of vision,—is to be found in the statement of Richard Scarle.

"One afternoon, a few years ago, I was sitting in my chambers in the Temple, working at some papers. My desk is between the fire-place and one of the windows, the window being two or three yards on the left side of my chair, and looking out into the Temple. Suddenly I became aware that I was looking at the bottom window-pane, which was about on a level with my eyes, and there I saw the figure of the face and head of my wife, in a reclining position, with the eyes closed, and the face quite white and bloodless, as if she were dead." [1]

In connection with the above I may mention an experiment of my own. A hypnotised subject, while realising the hallucinations suggested to her, saw the objects as pictures hanging on the wall. She was struck by a want of distinctness in the pictures (marine views), and explained it by the unfavourable character of the light, which was reflected from their surfaces. In reality, of course, the percipient had eked out an imperfect hallucination by imagining it to consist of pictures hung in a bad light.

Baillarger describes this class of phantasms as seen through a veil of gauze, or some similar substance; but in the following case the incompleteness of the externalisation is expressed a little differently. The percipient sees the phantasms quite distinctly, only he sees other objects through them.

[*Munich Collection*, xxix.] "I have seen and heard persons who spoke to me; they usually looked, I might say, *transparent*, like grey mist, yet they were wearing clothes like ours." [2]

[1] *Proc. S.P.R.*, vol. ii. p. 163.

[2] Compare also below (App. I.), *Munich Collection*, xxvii. p. 214.

In the statements accessible to me, I have but rarely met with this kind of phantasm, though it is a type to which the visions and spectres of pictorial art frequently conform, and which also occurs in various forms in the religious traditions of remote peoples; thus among the Omahas the name for spirits is "Wa-na-he," *i.e.*, transparent bodies. However, this type of partial externalisation sometimes crops up in experimental cases. I need only mention the case where the hypnotised subject was required to see the bearded experimenter as a young, handsome, and beardless man, as in fact he did, though at the same time he could see the old, bearded face through and behind the young one.[1]

Finally, coming to the highest development of hallucination, we have the realistic bodily appearance combined with non-perception of that part of the field of view covered by the apparition.[2] Indeed, in hypnotic cases it would seem that the vividly externalised phantasms produced by suggestion tend to appear more real than the actual objects or beings which they represent when placed alongside them.[3] The explanation is surely obvious.

Besides the differences in distinctness already dis-

[1] Forel, *Der Hypnotismus*, 2nd ed., p. 53.

[2] Forel's narrative, *op. cit.*, p. 65.

[3] Cf. for instance, Moll, *Hypnotism*, p. 168. "Y. being in the hypnotic trance, I say to him, 'When you awake, X. will be sitting on this chair; you will be wide awake and have all your senses about you.' Y., on awaking, in fact thinks he sees X. on the chair, converses with this imaginary person, etc. I then point out to him the real X. with the words, 'Now, which is the real X.? You see one on the chair, the other you see standing here.' Y. feels the chair and the real X., in order to convince himself which is X. and which empty air. After trying for some time, he finally comes to the conclusion, 'He is sitting here on the chair.'"

cussed, variations also occur in the colouring of the phantasms. Sometimes they are perceived only in outline and with no colour, sometimes they resemble photographs, showing light and shade only, others again resemble dark silhouettes. We are here reminded that among the Greeks and Romans the souls of the dead were held to resemble the phantasms of dreams, a conception probably arising out of the latter; the Tasmanians used the same word for shadow and ghost; the Algonkin Indians call the human soul *ödatshuk*—his shadow; in the Quiche language *natul* expresses shadow, soul; the Arawak *ueja* means shadow, picture, soul; the Abipones have only one word (*loakal*) for picture, shadow, soul, and echo.[1] Frequently, again, the images occur in their proper colours, sometimes fainter in tone, but sometimes extraordinarily bright and vivid.[2] Gratiolet asserts that hallucinations by night, in the dark, and with closed eyes, as well as in the case of the blind, are mostly light in colouring, even fiery, but somewhat pale, and with a tendency to undulatory motion; that in the dusk, or with defective illumination, white figures are very frequently seen, appearing to occupy positions in space at a measurable distance,

[1] Radestock, *Traum und Schlaf*, p. 11.

[2] Cf. A. v. Vay, *Visionen im Wasserglase;* Griesinger, *op. cit.*, p. 91; v. Schrenck-Notzing, *Die Bedeutung narcotischer Mittel*, p. 70. "The glowing colours of a sea-piece suggested to him by me whilst he was in a state of coma induced by haschisch, were remembered by Herr U. in all their vividness, and induced him to make use of the idea in a picture, especially the colouring, which otherwise (*i.e.*, in a waking condition) was never perceived with the same intensity." Cf. Radestock, *op. cit.*, p. 148; also Sander, "Sinnestäuschungen," *Real-Encyklopædie*, xviii. p. 326; Brach, "Geschichte eines Phantasma Visionis," *Med. Zeit. v. Ver. f. H. in Pr.* (1837, No. 5); *Smithsonian Institute*, ii. p. 9.

and not moving to and fro; and that those seem in full daylight most nearly resemble real objects.[1] Such a general statement as this, however, can scarcely be regarded as borne out by experience.[2]

It would also be a mistake to assume that all hallucinations will fit exactly into the above scheme. Thus there are phantasms which in the course of their development pass through different stages of definiteness, growing from vagueness to comparative distinctness, or, on the contrary, gradually fading away.

[*Munich Collection*, x. 13.] "In April 1886, between 4 and 5 A.M., upon awaking, I saw my sister, who had died at the age of nine, standing before my bed. She was dressed in her shroud, and had a wreath on her head. She approached my bed. At first I saw dim, nebulous outlines, out of which the figure was developed as it approached me. It was just dawning; her features looked deathly pale, as they had done in the coffin. I screamed aloud. The not yet fully developed figure vanished before my eyes. A sister sleeping in the same room was not awakened by my scream, and did not share my impressions. I had been greatly excited the day before, but believe that I was fully awake at the time."

"In the spring of 1889 I saw, at night, as I was lying awake in bed, a person nearly connected with me approach my bed. The course of the vision was as before. The face was distorted and ghost-like. My thoughts had been much occupied with this person during the past few days."

Von Krafft-Ebing[3] has noted that, in insanity, hallucinations often appear more dimly and indistinctly

[1] Griesinger, *op. cit.*, p. 99.

[2] J. Mourly Vold ("Expérience sur les rêves," *Revue de l'Hypnotisme*, Jan. 1896) found "that the colours seen before falling asleep, *particularly black and white*, tend to enter into dreams, or to evoke in dreams their complementary colours. In some cases," he adds, "it seems as though it were the contrast between darkness and the intense light which takes effect in the dream."

[3] *Sinnesdelirien*, p. 37.

in the first period, afterwards become clearer, and gradually cease during the period of convalescence.

While, on the one hand, there are some observations which seem to indicate (see above, p. 128, Note 3, and p. 129, Note 4) that hallucinations may leave after-images, others, again, might lead us to underrate the distinctness possessed by hallucinatory percepts. In some hypnotic experiments, for instance, it has been observed[1] that, "when subjects are asked to trace their hallucinations with a pencil, or even to describe them minutely, they often show a vagueness and uncertainty which their previous expressions and actions would hardly have led one to expect."[1] I do not think that we should be induced by such observations to assume that in these cases there is mere mental vision, and deny the sensory character of the phenomenon. Perhaps the whole assumption and inference is based on a trace of the "eccentric projection theory," which I have already given my reasons for rejecting. However, I shall insist no further on this for the present; nor shall I do more than call attention very briefly to the facts that an unpractised draughtsman finds sufficient difficulty even in tracing an image projected by the camera lucida on a sheet of paper, and that many people indicate quite a wrong position for the image of a house, for instance, reflected on the surface of a pond; or, at any rate, cannot point out the right one without stopping to consider. I only wish to adduce two principal circumstances in explanation. In the first place, the sub-consciousness that the objects perceived by hallucination are not real, and the uncertainty arising from the discord between surface

[1] *Proceedings of the American S.P.R.*, p. 98.

consciousness and sub-consciousness; secondly, and more especially, the dream-like condition of the percipient.[1]

Attitude of the Percipient with regard to the Hallucinatory Perception.—The attitude of the percipient towards the hallucination depends, in the first instance, as we shall see, on his belief in its reality. But even where this belief exists, its manifestations differ considerably. Sometimes the percipient behaves as would be required by circumstances, supposing him to be in the presence of an objective reality; in other cases he fails to do so. This circumstance has been adduced as a distinctive symptom of hallucination as opposed to pseudo-hallucination (*i.e.*, a vivid image of the imagination which yet lacks the feeling of sensory affection, and therefore is a mental image and not a true hallucination). However, this does not seem to me correct. That the condition of the hallucinant is frequently that of a man in a profound dream sufficiently explains the difference between his behaviour at such times and when awake. This is the explanation given by Krafft-Ebing for the circumstance that a person hypnotised by him, while allowing herself to be carried back, by suggestion, to her childhood, found no difficulty whatever in believing the season to be winter, though she could see the green leaves on the trees. Even when her attention was called to this point, she showed no surprise, but found an explanation in harmony with the apathetic condition of her mind at the moment—she thought she must be in a hothouse.[2]

[1] Compare J. Philippe, "Sur les images mentales," *Third International Congress for Psychology*, p. 235; also Forel's remarks, p. 237.

[2] Krafft-Ebing, *Hypnotische Experimente*, p. 28.

An example given by Kandinsky may serve briefly to illustrate my point—viz., that the experience may be a genuine hallucination although the percipient does not behave towards the apparition exactly as he would do with regard to the objective reality. This author reports the case of a person who perceived the hallucinatory figure of a lion (or, according to Kandinsky, "vividly imagined" a lion), and yet manifested no particular excitement, apprehension, or terror. Now, it is true that if the man in question had met in the street a lion escaped from some menagerie, he would have been seized by the above emotions. However, it is not the mere sight of the lion which would have excited his apprehension in such a case, but the same sight in conjunction with certain definite though chiefly sub-conscious associations. The sight of a lion in a menagerie will no longer affect us in the same way, even though a certain sense of uneasiness, oppression, and suspense may perhaps be produced by a secret misgiving as to the strength of the grating securing the cage. If, on the other hand, we see a lion, having finished his meal, lying drowsily behind the stout iron bars of his abode in the Zoological Gardens, there can no longer be any question of such a feeling; on the contrary, the sight is productive of a high degree of pleasure to the animal-painter.[1] The sight of a lion in a picture is certainly also a perception by means of the senses, but it does not produce a

[1] It is the hero's failure to take into account the different effects produced by impressions on the senses under different circumstances and with other associations, which gives rise to the comic situation in Daudet's "Tartarin de Tarascon," where Tartarin, while preparing to go lion-hunting in Algeria, takes nightly walks in the neighbourhood of a menagerie, in order to accustom himself to the roaring of the lions.

feeling of apprehension. If, in the case quoted by Kandinsky, the percipient was not terrified or excited by the apparition of a lion, this means no more than that, in consequence of the condition of the percipient's brain at that particular moment, the connection with the complex of elements usually associated with the idea of a lion roaming about at liberty did not and could not take place. The perception was confined to an isolated group of elements, corresponding to the ideas of heraldry, pictorial art, zoological studies, etc. For the sake of comparison, I here cite an experiment, in which the hallucination of a snake at first produced no corresponding emotion, but, later on, when the cognate associations had been called to mind, elicited the expression of extreme fear. I do not think that the first case is to be explained by calling the image a merely mental one, but that a hallucination of the senses is to be assumed in both cases alike.[1]

"Herr A., a medical student, was hypnotised by me. No similar experiment had ever been tried on him before. The suggested hallucination of the staff of Æsculapius was realised, but the staff declared to be of extraordinary size. The snake's life-like appearance was first pointed out to A.; afterwards, when it was suggested to him as living, it coiled itself off the staff, wriggled about the room and approached A., who, smiling and following its movements with his eyes, asked me, 'Do you always keep this snake in your room?' I interrupted the scene by exclaiming, 'Look out, it's a rattlesnake.' A. immediately sprang aside, asked anxiously if the poison-fangs had been extracted, and, on receiving a negative answer, fled, with every symptom of fear and confusion, from one corner of the room to another, hid behind chairs, and was so terrified that it became

[1] Cf. William James, *Principles of Psychology*, ii. pp. 442 *sqq.*; Dewey, "Theory of the Emotions," *Psychological Review*, ii. pp. 13 *sqq.*

necessary to put an end to the scene by means of soothing suggestions."

And if the behaviour of hallucinated persons cannot be taken as a test, no more can the presence of a certain feeling of subjectivity on their part disprove the sensory character of the experience. The subject of a genuine hallucination may be aware that his own imagination has furnished the material for the vision. He is able to indicate the subjective character of the hallucination, but thinks it real, nevertheless,[1] or, at any rate, cannot escape from it. Such a case occurs when patients state that their own thoughts, "the sound-images of their thoughts are words, with all the peculiarities of self-uttered words, pale images of words uttered by themselves."[2] Griesinger quotes from Esquirol the answer of a melancholic patient.[3] His attention being called to the erroneous character of his hallucinations of hearing, he remarked, in the midst of a conversation, "Do you ever think?" "Certainly." "Very good—you think to yourself, and I think out loud." Many patients believe themselves to think so loud that other people can hear their thoughts and are annoyed thereby; or they assume that their apartments are so constructed acoustically as to strengthen the sound, not only of spoken words, but even of unspoken thoughts (Grashey).[4]

[1] Griesinger, *op. cit.*, p. 94.

[2] Grashey, "Ueber Hallucinationen," *Münch. Med. Wochenschrift* (1893), p. 154.

[3] Griesinger, *op. cit.*, p. 91; cf. Leuret, *Gazette Médicale de Paris* (1834, No. 10). The latter mentions a patient who said of his voices, "C'est un travail qui se fait dans ma tête."

[4] Such hallucinations not infrequently play a considerable part in literature, especially in descriptions of the tortures of remorse, and the like. An example of such a description is to be found in Gerhard

Sometimes the feeling of subjectivity is feebler, The patient knows that the thoughts are his own, but they seem to be uttered by other voices. He still feels himself to some extent an active agent, but at the same time his receptivity is much increased. Such patients complain of their thoughts being uttered aloud by other people. When reading, they think some one is reading the same book aloud at the same time; and when writing a letter, they complain that a strange voice is dictating the thoughts to them.

In another variety of auditory hallucinations, the feeling of subjective origin becomes still more rudimentary. The contents of the hallucination are quite alien to the patient's mind, but a trace of the feeling remains; they hear their own thoughts, but do not recognise them as their own, considering them as "made" thoughts suggested to them by God or the devil, or some human being.[1]

We must not reckon in this category, however,

Hauptmann's *Der Apostel*, pp. 79, 80. "He strode along, with a feeling as if he were walking dry-shod over water. So great and awful he seemed in his own eyes that he had to admonish himself to humility. And as he did so, he could not help remembering Christ's entry into Jerusalem, and then the words, 'Behold, thy king cometh unto thee in meekness.' For a time, he still felt the girl's looks following him. For some reason or other he took care to walk exactly in the middle of the road. . . . At the same time, as if controlled by some force outside himself, he kept repeating again and again: 'Behold, thy king cometh unto thee in meekness.' Children's voices sang these words. They lay still unformed between his tongue and his palate, but the sound of his breath seemed to become articulate, and in it he heard them. . . ."

[1] In addition to many other cases, Kandinsky reports such hallucinations as experienced by himself. He thought them too absurd to have originated in his own mind, and took them as "induced" by some of his fellow-patients.

a certain not uncommon type of dream where the dreamer is haunted by the feeling that whatever happens is not actually true—that it is only a dream. He sees other people, perhaps even himself, performing certain actions; he hears conversation, but all the time the conviction that he is only dreaming persists in his mind. This is also manifested in other ways—*e.g.*, the dreamer dreams that after doing something or other he lies down tired, goes to sleep, and dreams. Sometimes this dream within a dream is so distinct and complete that the action interrupted by it is continued from the point at which it was broken off. It is also sometimes reported of sick people and hypnotised subjects that, along with the hallucination, from which they cannot escape, they have the consciousness that it was only a delusion of the senses. Or, again, the percipient may succeed in correcting the hallucination, but it returns the next moment.[1]

[1] A good example of this, and also of the effect of *points de repère* in suggesting the same delusion over and over again, is offered in the case referred to by Rosenbach (*Centralblatt für Nervenheilkunde*, April 1, 1886). X, of a healthy family, had no further trouble to complain of than periodic digestive disturbances, followed by sleeplessness. Examination showed a normal state of the organic functions, except for a moderate degree of hereditary myopia. He was able to undergo without difficulty the severe mental labour connected with his profession. But for the last few years he has noticed that, after working, he seems when in the street to meet none but persons known to him. It is only after bowing to them that he finds himself mistaken. Sometimes he sees people of whom he has not even thought for years; yet he is not one of those who are always on the look-out for resemblances. The details of the process are as follows: On the first glance he sees a person of his acquaintance standing before him, but closer examination soon convinces him that he has made a mistake. Yet, in spite of this, the hallucination is caused anew by another look at the face, a few moments later, though immediately corrected by the recollection of the previous discovery.

In these last-named cases it is not the feeling of subjectivity with which we are concerned, but the *belief* in the objectivity of the hallucination. A patient may suffer from the utterance of his own thoughts, as above described, but need not therefore be in any doubt as to the reality of the voices accompanying his thoughts. Moreover, even if the belief in the reality of the appearance or voice does not necessarily accompany the hallucination, yet it is certain that the latter is in most cases so accompanied. It cannot be the quality of the psychic occurrences which distinguishes the hallucination from an objective perception. In some cases only its content may, by the impossibility of reconciling it with other experience, awaken doubts. Yet, as all our knowledge comes to us through the senses, as it is they which, every moment, enable us to receive new impressions, and as in ordinary life we find them trustworthy witnesses, we need very strong reasons to persuade us to examine into the objectivity of any perception.[1] If a lady passing along the corridor in a hotel sees the apparition of a man standing at the open door of the lift, there is no occasion for her to inquire whether the appearance corresponds to an objective reality any more than there is in the case of a lady who hears the door-bell ring without knowing that no one has touched it. Thus it often happens that the percipient finds himself repeatedly deluded by hallucinations before it occurs to him to doubt the reality of the appearances while they last. When he has once dis-

[1] Compare the way in which children, or primitive peoples, are completely at the mercy of sense-impressions—subjective as well as objective.

covered their true character, however, his blind belief in the evidence of his senses is thoroughly shaken.[1] Or, again, the content of the hallucination may awaken doubt and misgivings. The apparition of a dead person, for instance, would naturally suggest the visionary character of the experience. Thirdly, the doubt may arise from the contradiction between the hallucination and the sub-consciousness of its unreality. The hallucinant is in doubt; when asked what is the matter, he does not reply, not being sure whether "his senses have deceived him."[2] Or, in many cases, he asks, "Am I asleep or awake?"[3] Others are induced by their uncertainty to test the matter. Thus Holland[4] relates that a patient, having discovered that he was able to suggest words to the voices at pleasure, succeeded in recognising his auditory hallucinations as such. A lady saw the apparition of her sister, and thought, "If this is really she, I ought to see her reflected image in the mirror." A young man, who continually heard his thoughts uttered aloud, went into an open field, with no house or tree in the neighbourhood. He could see no one but a labourer ploughing at a great distance. When, even here, he heard his thoughts spoken so loudly that they could not possibly be uttered by the voice of the distant ploughman, he became convinced that what he heard was a hallucination.

Attempts to Explain "Audible Thinking."—Many attempts have been made to explain these hallucinations of voices uttering the percipient's own

[1] The visions of Nicolai are well known in this connection.

[2] Statement of Mrs. Townsend in *Proc. S.P.R.*, vol. iii. p. 75.

[3] Statement of Ch. Jupp, *ibid.*, p. 88.

[4] Sir Henry Holland, *Chapters on Mental Physiology* (2nd edit.), p. 52.

thoughts—*e.g.*, by assuming a duplex action of the cerebral hemispheres.[1] Cramer's explanation has already been given (cf. page 183). Grashey[2] takes quite a different view of the matter.

He finds that the difference between the two processes corresponding respectively to sensory perception and ideation is not, as I think, in kind, but consists, firstly, in the different degree of intensity, and, secondly, in the feeling of the connection between our memory-images and the earlier memory-images which called them forth; in the connection of our present thought with the chain of our thoughts, with its predecessors, which gave birth to it. (Physiologically, the process of association corresponds to this feeling.) An excitation proceeding neither from the peripheral organs nor through the association-channels of the cerebral cortex, he calls a hallucinatory excitation; every sensation produced by such excitation a hallucinatory sensation, and every perception composed of hallucinatory sensations a complete hallucination;[3] he considers as illusions all perceptions arising out of hallucinatory sensations combined with sensations coming from the peripheral sense-organs. If the two above-mentioned criteria are lost to the consciousness (as, *e.g.*, in sleep) no genuine hallucination arises, but, *e.g.*, a hypnagogic fallacy of judgment. The surprisingly clear and definite form assumed by the memory-pictures of objects looked at for some hours is caused, first, by a state of irritation in the corresponding parts

[1] See above, pp. 180-184. [2] *Op. cit.*

[3] Compare with this view the criticism at the end of Chapter IV., *supra.*

of the cerebral cortex, and secondly by the fact that the attention, being now diverted from this sensory region, is less directed to the processes of association which call forth the vivid memory-picture. If the many accustomed stimuli of average intensity are shut out from any one sense it is only reached by sensations of slight intensity, so that the memory-images assume a surprising distinctness. If patients, even without the accompaniment of unusual external quiet, distinctly hear *their own* thoughts ("imperfect hallucinations," since the excitation takes place through the association-channels, although with abnormal intensity), there is a morbidly intensified irritability of the parts of the cortex in question. If, on the contrary, the thoughts heard are those of other people, we must assume more or less intense pathological processes at the points where the memory-images of these processes are stored up.

More correct than this view is probably the one represented by Hoppe (among others), who distinguishes:—

1. Subjective noises from the neighbourhood of the auditory nerves, and of the ear, and in the head—*i.e.*, all sounds heard which do not immediately announce themselves as specifically belonging to the ends of the auditory nerves. These are caused, indeed, by an irritation of the auditory nerve, but a *secondary* irritation, or they may in other cases arise from a primary irritation of the auditory fibres not manifesting the special form of excitation required for the production of articulate sounds. With these may be grouped all noises in the head conducted through the bony parts to the ear, or reaching the auditory centre by centripetal channels.[1] 2. The peripheral

[1] Hoppe, *Erklärung der Sinnestäuschungen*, p. 236.

awakening of the impressions stamped on the ends of the auditory nerve in the *ear* (after-images—permanent images). 3. The phenomena with which we are now concerned—so-called auditory hallucinations, which, however, consist merely in the *unnoticed articulation* of one's own thoughts, which becomes audible, and takes the form of an auditory hallucination without determinable origin.[1]

All thinking—or, at least, all verbal thinking—is connected with centrifugal motor innervation of the muscles which regulate the articulation of speech, as well as of other (mimetic) groups of muscles. The slight movements resulting herefrom do not usually reach our consciousness; but it is possible, by observing one's self, to feel the movements in the vocal apparatus.[2] If the innervation is strong enough, then it becomes a more or less audible speaking. Now, if it were possible to assume that, while the sounds themselves are received by the ear, the articulation which takes place makes no impression on the consciousness, the result would be an auditory perception, whose production by our-

[1] *Ibid.*, p. 248.

[2] Klinke, "Ueber das Symptom des Gedankenlautwerdens," *Arch. f. Psych.*, xxvi. p. 155. "Unprofessional persons, who have never heard of motor sensations . . . when verbally thinking, feel no motor sensations in the articulatory apparatus; at least, after questioning a succession of individuals, I could never succeed in ascertaining anything of the sort. Only after the explanation had been given to them, and the motor sensation pointed out, one or another thinks he can detect such impulses in the organs of speech, or even, as in the case of one of my patients, in the forehead, or the tip of the nose." (For this transference of sensation cf. examples given on the following page.) *Id.*, p. 198. "One can, indeed (especially after a detailed study of Stricker's proofs that, when a person is thinking in words, slight motor impulses are continually imparted to the organs of speech), believe that one really feels certain slight sensations in the tongue, the mouth, and the epiglottis. . . ."

selves would remain unknown to us, and whose origin we should be unable to trace. There would result, then, either the above-mentioned phenomenon of audible thinking, or—the thing heard being referred to a real or fancied personality—the other forms of the delusion described above would naturally follow. If the thing heard is associated with pressure on the præcordial region, unpleasant sensations in the abdomen, pains in the leg, etc., the transference of the voice—as stated in various narratives—to the chest, the toes, the abdominal region, etc., would follow as a natural consequence.[1] (Cf. *supra*, p. 175, note 1.)

This being assumed as a preliminary, it is, of course, unnecessary that the patient should articulate aloud, or so that the articulation should be observed in any way by the persons present. A fusion of what is softly articulated, or of the sound produced by the current of breath influenced by articulation, with any coincidental subjective noises, or its perception during a possible hyperæsthesia of the auditory nerve, would easily explain the perception of "spoken words" even with very faint and perhaps scarcely perceptible articulation.[2]

[1] Klinke, *loc. cit.* (pp. 155 *sqq.*), has stated the objections to the view that, in every case of verbal thought, slight motor processes must take place in the vocal apparatus. Apart from the weakness of the objections, the possibility of thought without such motor processes in the vocal muscles makes no difference whatever as far as the hypothesis here adopted is concerned, the point being that such movements *usually* do take place. If they are absent in some particular cases, the result is only that there is no "double thinking."

[2] Persons suffering from affections of the ear frequently state that their own voices sound louder to them. Gruber, "Ueber Autophonie und Tympanophonie," *Monatsschrift für Ohrenheilkunde*, ii. 8 (1868). Cf. Klinke, *loc. cit.*, p. 153. "I will now briefly touch upon the

The most important question, however, is whether we are justified in assuming that the movements of articulation could escape the consciousness. Such an assumption will scarcely seem a rash one, considering the number of analogous cases observed in other muscular groups. I have already called attention to the slight, rapid movements of the eyes, of which the patient is quite unconscious, in cases of vertigo. The result of these unconscious eye-movements is identical with what I am assuming to occur in automatic articulation. We see movement, but are not aware that it is our eyes that move and therefore transfer the movement to surrounding objects which appear to revolve round us.

Automatic writing, in which the hand writes, while the consciousness is unaware of the action, is another example of the same thing. Here, too, the motor impulses set the muscular apparatus in motion, while our upper consciousness knows nothing of the action except through the result, afterwards looked on with incredulity by the writer, who denies having written the words, and either thinks he has been made a fool of, or attributes the writing to spirits (mediumistic writing).

The complete correspondence between automatic writing and automatic articulation will be best shown by the following parallel table:—

phenomenon of heightened voice-innervation cited by Kandinsky (cf. Cramer, *op. cit.*, pp. 16, 17). After subcutaneous injection of one milligram of hyoscine, I felt—in addition to visual hallucinations and illusions, and atactic phenomena—when I spoke that my own words sounded extremely loud. They seemed to me to come from above—from a point directly over the vertex . . . and several times I was uncertain whether the words I heard did not come from outside—*i.e.*, from another person."

RESULTS.

In automatic action of the muscular writing-apparatus.[1]	*In automatic action of the vocal organs.*[2]
1. Up and down strokes without recognisable meaning.	1. Inarticulate sounds without recognisable meaning; when vigorously uttered, objectively perceptible as *vociferation*, or ecstatic "speaking with tongues"; when the utterance is feeble, subjective perception of "confused noise," —"many voices talking at the same time."
2. The hand writes the same word or sentence over and over again. (Occurrence of mirror-writing, anagrams, etc.)	2. Subjective perception: The same word or sentence heard over and over again, *e.g.*, "*Onkel August*," "*hepp, hepp*," "Do not eat," "Kill your child," or strange words, as, "*Lolch-graf*," etc.
3. The hand writes sentences, often long and complicated, belonging to the subliminal consciousness.	3. Subjective perception: Hearing of strange voices: "Thoughts are made for me." (This case sometimes develops out of the former).[3] Objective perception: somnambulistic prophecy.
4. The hand writes what the person is consciously thinking; but the person does not consciously or intentionally influence the writing.	4. Subjective perception: Audible thinking, double thinking. Objective perception: attacks of chattering; Friedreich's co-ordinated memory-spasms.

[1] Cf. the series of articles by F. W. H. Myers in *Proc. S.P.R.*

[2] Compare "A Case of Psychic Automatism, including Speaking with Tongues," by Albert Le Baron, communicated by William James, *Proceed. S.P.R.*, vol. xii. pp. 277 *et seq.*

[3] Ball, *Maladies mentales*, p. 67. Also the hallucinatory "running commentary" on conscious thoughts mentioned, *e.g.*, by Ziehen, *Psychiatrie.*

5. The hand writes automatically, but the conscious train of thought on the part of the subject influences the character of the communication.	5. The patient is able to direct the voices at pleasure.

The foregoing view is not only theoretically tenable, but finds further support in medical observations on hallucinated patients. Thus Moreau[1] observed an insane patient who, when under the influence of hallucinations, moved his lips, and therefore was no doubt softly uttering the words which he heard from imaginary voices.

Michel[2] reports the remark of a patient that his auditory hallucinations—the words which forced themselves upon him—accumulated in his mouth, so that his saliva was impregnated with them. Hoppe[3] cites the case of a lunatic with persecution-mania, whose auditory hallucinations (consisting of abusive language) were accompanied by a twitching in his head, and who also declared that he perceived a gentle plucking in his mouth, and especially in the epiglottic region. With this may be compared Hoppe's observations on himself:—[4]

"I was suffering from a slight inflammation of the left ear, and was lying in bed, on my left side, prepared to go to sleep. In consequence of the pressure and the pulsation I heard the secretion in the left ear moving with a slight crepitation. It occurred to me to imitate this noise articulately; I therefore gave the necessary impulse to the articulatory muscles and very soon my imitative articulatory motions were pro-

[1] Moreau (de Tours), *Du Haschisch*, etc.
[2] Michel, *Gazette des hôpitaux* (1864); *vide supra*, p. 28, Note 1.
[3] *Op. cit.*, p. 217. [4] *Op. cit.*, p. 229.

duced with extreme rapidity, while I heard them in my ear, and *felt them in my mouth*."

We may also cite in this connection the note of Kandinsky's already made use of by Hoppe. Kandinsky, having played on the zither before going to sleep, suddenly, when in bed, heard the beginning of the piece which he had been playing. After this the tones followed one another with increasing rapidity until the tune died away.[1]

Langwieser's patient[2] at first had auditory hallucinations, to which were gradually added those of smell, sight, etc. In eating, he could not perceive the deglutition of the food, and never felt that he had had enough. Every morsel turned round of itself in his mouth and was snatched aside; what he drank seemed to be lost under his tongue, and not swallowed. His tongue felt as though it hung by thirty or forty fine threads, which were continually being pulled, so that it moved constantly of itself. In speaking, he felt as if the words were being dragged out of his mouth.

According to Séglas,[3] a patient said, "When I think, I cannot help speaking, or I should choke. Even if I do not speak aloud, if you watch carefully you can always see my lips moving; but this

[1] Cf. the way in which one is haunted by tunes, especially dance tunes. This, too, usually arises from an automatic and continued production of the particular rhythm. In most cases it is the rhythm alone which possesses the sensory quality, though the imagination fills it in with the remembered tones of voice or instrument.

[2] Langwieser, "Exquisiter Fall von Hallucinationen," *Spit. Zeit.*, 1863, Nos. 46-48.

[3] "L'hallucination dans ses rapports avec la function du langage; les hallucinations psychomotrices," *Progrès médical*, 16e année 2, série viii., Nos. 33, 34.

is still more the case when I hear voices out of my belly." Further material in abundance is to be found among the cases discussed in the article of Klinke's already cited. In one patient frequent movements of the lips were noticed, as though he were talking to himself; another denied that he was forced to repeat what he heard, but felt his tongue becoming heavy, etc.

One of the best cases is that recorded by Sir H. Holland (1840), and afterwards rescued from oblivion by Pick.[1] A man aged 85, physically weak, but with his mental faculties quite unimpaired, who had never suffered from any brain affection, had a fall in which he struck his forehead, causing a swelling. After this he could no longer remember the names of his servants, or find the right words; all speech sounded to him unintelligible and indefinite. These symptoms ceased after two days. Some days later he went out for a drive. Immediately he was aware of voices, but these voices were as ataxic and aphasic as the patient himself had previously been. On his return from the drive, when reading, the symptom of audible thinking occurred, the voice sometimes being in advance of what he was reading, but never farther than his eye could reach.

In explanation of this case one might assume that the functional derangement had not quite passed away, that the shaking during the drive again threw the vocal mechanism out of order; but that this disturbance was too slight to override the strong impulses on which speech is based, although able to make itself felt in the wider innervation accompanying the act of thinking. This would furnish a very simple explanation of the conversations between hallucinated patients and their ghostly counsellors or persecutors. V. Parant mentions the case of a

[1] *Prager medicalische Wochenschrift*, 1883, No. 44.

female inmate of a lunatic asylum, who, whenever she fancied herself threatened, or in any trouble or difficulty, went to some fixed place, and there received, from imaginary persons, advice which always corresponded with her wishes.[1] Another was in the habit of playing at "odd or even" with an apparition, who always obligingly guessed the wrong numbers. The phantom was less complaisant in the case of a woman who was constantly studying a law-book, and in her imaginary disputes was always defeated by the arguments of her opponent.[2]

Just as external rhythmic sounds, repeated for a considerable period of time, like the rumbling of a train, the sound of breathing, etc., can so influence us, that a tune, or a sentence pronounced rhythmically, forces itself on us in continual repetition, so the

[1] *Ann. méd.-psych.*, 6th series, vol. vii. p. 379; Ball, *Maladies mentales*, p. 98. Other cases have been previously mentioned.

[2] This case may perhaps be compared with one of those dreams in which, *e.g.*, the dreamer imagines that he is in school and is asked a question by the master which he cannot answer. He finds himself in the greatest embarrassment; and the master asks the next pupil, who then gives the correct answer. The explanation of this *esprit d'escalier* which sometimes occurs in dreams is usually this: that the state of excitement does not allow the idea which is pressing forward to reach the consciousness, but that the attention is entirely devoted to the seeking, to the exclusion of the finding. It is only when the tension is relaxed that the thing sought for penetrates into the consciousness. Yet how many of these so-called "correct answers" are really correct, and do not rather consist in an entirely meaningless vocal motion, which, through the emphasis it receives from the feelings, produces the impression of having been correct? Compare with this, on the other hand, the following from Ziehen's *Psychiatrie* (p. 27):—"I know a patient who regularly carried on the study of Italian; when he repeated lists of words to himself, it sometimes happened that he did not know a word, or said it wrongly, and the voice told him the right word."

same is the case with intra-aural sounds, pulsations, etc. In this connection a narrative of C. Fürer's[1] is of interest. Without being acquainted with the form of auditory hallucinations here to be described, Fürer, when still suffering from an imperfectly healed perforation of the left tympanum, made on himself an experiment in the inhalation of ether. Hereupon there set in, among other symptoms, a rushing in the ears, chiefly localised on the left side, then strong hyperacousia, followed by steadily increasing pulsations in the left ear. These pulsations produced the mechanical repetition of the words "tom tom s s, tom tom s s," in the form of obstinately recurring mental images (*i.e.*, softly articulated by himself), which increased in distinctness, till it assumed the character of a hallucination. He thought he could distinctly hear a person standing on his left, shouting these words to him, marking the rhythm and keeping time with the pulsations in his ear.

In connection with this observation on himself, he cites three other cases, in which the patients (acute hallucinatory insanity, imbecility, maniacal period of circular insanity) were subject to auditory hallucinations of a rhythmic character. In two of these cases an examination of the ears was instituted. It was found that, in the one, chronic changes of connective tissue had taken place over circumscribed areas in both tympana—a condition frequently accompanied by noises in the ears. The second patient was found to

[1] C. Fürer, "Ueber das Zustandekommen von Gehörstäuschungen," *Centralblatt für Nervenheilkunde u. Psychiatrie*, New Series, v., Feb. 1894. These rhythmic auditory hallucinations are frequently to be found in published reports of cases.

be suffering from chronic affections—on one side, of the middle ear, on the other, of the labyrinth.

I am inclined to find further confirmation of the hypothesis just stated, in the occurrence of certain objective phenomena akin to this type of hallucination—viz., spasmodic attacks of chattering, Friedreich's co-ordinated memory-spasms, etc. While the latter are, in fact, nothing else but the carrying out of "continued" movements,[1] the former correspond throughout to "audible thinking." Kandinsky describes such a case, in which the patient, fearing to betray his thoughts by his rapid, mechanical chattering (resembling the noise of an alarum-clock), ran into the water-closet till the attack had passed away.

A fact specially pointed out by Burckhardt[2] in his interesting work seems to me not without importance. Starting with the idea that irritation of the cortical area, whose destruction deprives the human subject of the power of understanding spoken words, might so act upon the hearing-function as to cause hallucinations of words and sentences, he searched through medical literature for evidence of a relation between auditory hallucinations and affections of the temporal lobes. But while Nothnagel is able to adduce *visual* hallucinations as symptoms of lesions in the *occipital* cortex, no definite indications of a corresponding connection between acousmata and

[1] Professor Wille knew a paranoic professor of botany who would continue counting up the genera and species of plants for four hours at a time.

[2] G. Burckhardt-Préfargier, "Ueber Rindenexcisionen, als Beitrag zur operativen Therap. der Psychosen." Paper read at the Berlin International Medical Congress.

lesions of the temporal lobes are to be found.[1] Nevertheless Burckhardt holds that it by no means follows from the silence of the authorities as to auditory hallucinations in temporal lesions of the cortex, "that Wernicke's convolution has nothing to do with the origin of auditory hallucinations." He considers it most probable that, "besides Wernicke's convolution, other cortical regions connected with the function of speech must be simultaneously excited. I was thinking," he adds, "in the first instance, of Broca's convolution, and of the possibility that it is only through the co-operation of the *motor* element located there that the hallucinations attain the strength and clearness of the spoken word." Quite so, they possess this strength just because they *are* spoken words.[2]

[1] In Ladame's catalogue (*Hirngeschwülste*, Würzburg, 1865) two cases of "hallucinations" in tumours of the "middle lobe" are cited, but not one in tumours of the convexity. Bernhardt (*Hirngeschwülste*, Berlin, 1881) summarises five cases of tumour in the temporal lobes, or their immediate neighbourhood, with rushing and buzzing in the ears, and three with deafness (equal on both sides), but never mentions auditory hallucinations. In the case of Wernicke and Friedländer (*Gehirnkrankheiten*, iii. p. 338) these are likewise absent. Nothnagel (*Top. diag.*) does not speak of them, neither does Roger (*Lésions corticales*, Paris, 1879) or Pierson (*Die Localität der Hirnkrankheiten*, 1880); the latter, however, gives the lack of observations as a reason for the omission. Naunyn says nothing of auditory hallucinations in temporal (cortical) lesions.

[2] Note, especially, in Case V. the difference in the effect of the excision of the grey matter in the acoustic, and of the second operation in the motor vocal area. The observation is, as it were, complementary to the case narrated by Pick, after Sir H. Holland (*vide supra*, p. 265). It may also be mentioned that, according to Sérieux (*Archiv. der Neurologie*, May 1894), the autopsy in the case of a paralytic woman, subject to auditory hallucinations of a pronounced motor character, showed scarcely any changes except in the third frontal convolution on each side.

To this it might be objected that all the examples given above, in which the patients were more or less distinctly aware of the movements of their vocal organs in audible thinking, are so many direct refutations of the explanation I have given. This objection may be met by referring to the example given by Gurney (*vide supra*, pp. 154 *sqq.*), and the considerations which it suggests. One may, however, specially point out that, in most cases, patients consider themselves as passively enduring the unrecognised vocal movements. The one theme, whose variations we meet with in the statements of patients, runs thus: "My tongue is moved—some one is speaking in my mouth." Here just that sense in the patient of his own activity, which Cramer's hypothesis implies, is absent.

Not satisfied with all these arguments, I have tried experiments in order to produce automatic articulation. From the series of experiments, which (so far as any automatic articulation took place at all) for the most part yielded positive results, the following example may be given.

A. having been hypnotised, these directions were given him (carefully written out beforehand, so as to avoid any unintentional suggestions connected with *hearing*):—"You are aware that no thinking is possible, except in words. When I wake you, after a time, you will articulate all your thoughts very forcibly. You will only do this until I give you an order to the contrary. You will articulate all your thoughts very forcibly, but you will not notice that you do so; you will not be conscious of moving your epiglottis, your tongue," etc. I expected speech as a result of this suggestion. This did not take place.

On the contrary, after A. had been awakened, he assumed, almost immediately, a *listening* attitude. *His expression showed intense expectation; his look was directed sideways.* After a considerable pause, he remarked spontaneously, "Tell me, do you think there is any one in the room?" "Yes, you and I." "But is there no one else?" He cast his eyes searchingly about the room, and once more assumed a listening attitude. In order not to suggest to him any ideas having reference to this matter, and to leave him uninfluenced, in view of future experiments, no further questions were put to him.

From all this, it would appear that the greater number of the "voices," if not all, are caused (in flat contradiction to Cramer's theory) by automatic speech on the part of the percipient. As in all automatism, we must assume here, as in genuine hallucinations, a dissociation, a splitting off, even in those cases where the hallucinatory perceptions form the only symptom visible to the observer.

CHAPTER IX.

TELEPATHIC HALLUCINATIONS.

Results of the International Census—Various sources of error: (1) Hallucinations of Memory, (2) Reading back of details after the event, (3) Exaggeration of the Coincidence—Comparison between Coincidental and Non-Coincidental "Waking" Hallucinations misleading—Indications of Dissociation in the Death-Coincidences of the Report—Association of Ideas not to be ignored—Other proofs of Telepathy Criticised—Alleged special characteristics of "Telepathic" Hallucinations.

IN any general discussion of hallucinations it is impossible at the present day to ignore the question of "telepathy."[1] Apparitions are frequently reported as coinciding with the death or with some exceptional crisis in the life of the person whose presence they suggest, and there is a disposition in certain circles to regard these as "veridical," that is to say, as depending in some way on the event which they shadow forth. Numerous attempts have been made to explain these "coincidental hallucinations," which it is supposed are of too

[1] The hallucinations of "clairvoyance" I purposely pass over here. The evidence for this reputed faculty seems to me of quite inconsiderable value, even that part of it which has been critically examined and sifted being open to grave objections. One of the most important contributions to the subject is Richet's "Relation de Diverses Expériences sur la Transmission Mentale, la Lucidité, etc.," *Proceed. S.P.R.*, vol. v. pp. 18-168.

frequent occurrence to be merely fortuitous—attempts ranging from the first crude theories, the belief in ghosts, guardian angels, and so on, to the modern hypothesis, put forward with due reserve and based on an astonishing mass of material, to some extent critically handled, which we owe to the researches of the English S.P.R., and especially to the authors of *Phantasms of the Living*.

But before formulating new theories, we ought first to make sure that veridical coincidences[1] really do occur more frequently than chance will explain. The question whether we must postulate a new cause or attribute the coincidences to mere chance, may thus be regarded as purely a question of figures.[2]

[1] I shall call a case "veridical" when the content of the hallucination corresponds to the event to which it is supposed to refer (for instance, the apparition of a friend who is dying), and I shall use the word "coincidental" only with reference to the correspondence in time between the veridical hallucination and the event.

[2] The Report calculates the probability of chance coincidence in cases of death as follows:—"The fact that each of us only dies once, enables us to calculate definitely the probability that that death will coincide with any other given event, such as the recognised apparition of the dying person. Taking as a basis for calculation the average annual death-rate for England and Wales for the ten years 1881 to 1890, as given in the Registrar-General's Report for 1890, namely, 19.15 per thousand, we get as the probability that any one person taken at random would die on a given day, 19.15 in 365,000, or about 1 in 19,000. This, then, may be taken as the general probability that he will die on the day on which his apparition is seen and recognised, supposing that there is no causal connection between the apparition and the death. We ought therefore to find that out of 19,000 apparitions of living persons, or persons not more than twelve hours dead, one is a death-coincidence." Compare the chapter on the Theory of Chance-Coincidence, vol. ii., pp. 1-28, in *Phantasms of the Living*, and two articles in the *S.P.R. Proceedings* for 1885, pp. 190 *et seq.*, and 1886-87, pp. 189 *et seq.*; also an adverse criticism of the evidence in the *Proceedings of the American S.P.R.*, pp. 180 *et seq.*, and a review

The first obstacle which we encounter is the difficulty of obtaining satisfactory evidence of the coincidental character of the phenomena. The English observers simplified their task, and at the same time adopted a limit which seemed to them sufficient, by including only hallucinations reported as occurring within twelve hours of the event to which they were supposed to relate.

The reason given—a sufficiently plausible one—for allowing this interval is that a "telepathic" impression (that is to say, an impression conveyed to us by some still unknown means, but in any case not through the normal sensory channels) probably takes place sub-consciously, and can emerge as a hallucination only when a favourable psychical state occurs, as we saw, for instance, in crystal visions.[1]

Whether or not this supposition would be found to cover the facts if the existence of a telepathic agency were demonstrated, to adduce it while the proof of telepathy is yet to seek is rather like arguing in a circle. In any case it is to be noted that the conception of coincidence is in this wise not inconsiderably extended.

of *Phantasms* to the same effect in the *American Journal of Psychology*. In all attempts at calculation we must keep constantly before us the fact emphasised by Edgeworth in the *Proceed. of the S.P.R.*, 1885: that "*the calculus of probabilities cannot reveal to us the nature of the agency, whether it is more likely to be vulgar illusion or extraordinary law.*"

[1] It does not come within the scope of the present work to discuss the various forms (emotion, involuntary movements and ideas, etc.) under which telepathy is supposed to manifest itself. For a general survey of the theory of telepathy and the evidence upon which it rests, see Frank Podmore, *Apparitions and Thought-Transference, an Examination of the Evidence for Telepathy* (Contemporary Science Series), London: Walter Scott.

One of the main objects of the International Census of Hallucinations, with the results of which I have dealt more fully in a previous chapter, was to discover the actual proportion between the number of hallucinations in general and those which are "veridical," which coincide, that is, with a corresponding experience. On the first glance, the result of the Census seems distinctly favourable to the hypothesis of telepathy.[1]

Result of the Collections.—In the English Collection, with which I shall chiefly deal, we find 372 hallucinations of a distinct and vivid kind, which represent living persons. (I take these figures from the "first-hand" cases, and shall henceforward ignore the "second-hand" accounts, as being insufficiently attested.) Of the 372 first-hand cases 67 (18 per cent.) are reported as occurring coincidentally with the death of the person whose "apparition" was recognised.[2]

The final figures of the American Census are not yet to hand, but its results so far, as communicated by Professor W. James in a letter to the Munich Congress, appear to be even more favourable to telepathy than the results of the English Collection. (In the latter the coincidences are 292 times more numerous than chance would allow, while Professor James reckons the disproportion in his cases as no less than 487.) But his 12 death-coincidences can hardly be taken seriously, since "only five" of them "have any corroboration, and in no case is it first rate"! With such data, above all in dealing with so baffling and so vexed a question, no conclusion can

[1] Compare below Appendix II., Table 8.

[2] According to the Report, 65 coincidental cases, besides 15 other cases which were rejected on various grounds.

safely be drawn. It is futile to guard against forgetfulness and so on when it is not even certain that one genuine veridical coincidence is to be found among the cases. Marillier's French Collection gives 35 first-hand coincidental cases = 1.7 per cent. of all the hallucinations reported. But in the majority of these cases he found it impossible to obtain any further details, or independent confirmation of the statements. He received on the whole the impression that the coincidences appeared to the narrators closer than they really were.[1] The Munich Collection[2] is distinguished by the great number of cases in which the percipient reports the coincidence of the vision, voice, or touch with a death. It is also relatively rich in cases where several persons simultaneously shared in the hallucination (see cases in Appendix I.).

Arguments Against the Veridical Nature of the Cases Reported.—It is among the narratives of this last Collection, however, that the most obvious indications are to be found of the common tendency (which is perhaps responsible for most reported coincidences) to connect events, especially those which are important and striking, with each other. Take, for instance, the following case:—

(Munich Collection, iii. 23.) "I hereby certify that in May 1888 my wife and I were awakened simultaneously by a loud noise, which sounded like the breaking of a glass door and the falling of the splinters. There was no such door in our house. I went to see what was amiss, but found everything as usual. Three weeks after my father-in-law died."

Captain K.'s narrative[3] is equally characteristic.

[1] *Report of Second International Congress of Psychology*, pp. 66 *et seq.*

[2] See below, Appendix II., Table 8.

[3] See Appendix I., Munich Collection, xvi. 2 *b*.

He states that he saw a black balloon-like ball ascend into the sky, whereupon he immediately thought of his mother, who was ill, although she was then expected to recover, and he was not feeling anxious at the time. "Next day," he adds laconically, "I found my mother worse (unconscious); on the 29th October she died" [3-4 days after the apparition].

Hallucinations of Memory.—It is not improbable that we have to deal in many of these cases with a mnemonic error of a peculiar kind. Thus I should be inclined to refer with Royce[1] a large class of recent cases, vouched for by persons whose honesty is undoubted, and who are in nowise superstitious or inclined to mystical beliefs, to a hallucination of memory consisting in the impression at the very moment of some exciting experience, or at a longer or shorter period after it, *that one has expected it before its coming.*

Royce suggests a provisional explanation of the process; we might call it a sort of "cramp of recognition," a "momentary spasm of the activity of apperception," he says. As one to whom a stranger has accidentally bowed on the street momentarily tries to believe that he does after all recognise the stranger, so one surprised by a calamity, even in the midst of the shock of it, still tries to believe that things were always so with him. "Just my luck!" cries one. "It was sure to happen, I knew it before," exclaims another. These are, of course, only half-sincere, conventional ways of meeting misfortune. They produce in general no hallucination. But sometimes under the sudden strain, or soon after the blow has fallen, consciousness gives way, the spasmodic effort to "realise" this new intolerable thing, to familiarise the mind with it, overshoots the mark, and a kind of pseudo-recognition takes place. The experience now seems strangely familiar. We must have known it before, we had a presentiment of it.

[1] *Proceedings of the American S.P.R.*, pp. 366 *et seq.*

This process, which occurs sporadically in certain sane people under certain exciting conditions, may in abnormal cases become the more or less constant accompaniment of every act of apperception. It is not, however, a form of mnemonic error often observed among the insane.[1] Kraepelin speaks of it as represented by "a small group of observations." The patient, he says,[2] is perfectly conscious of his real surroundings, and events wear a familiar face to him, not because he thinks he has experienced them before, but because he imagines they have been revealed to him in visions or foretold to him in some mysterious way.

Since such a fallacy of memory is just as capable of deceiving as a sensory hallucination, and since it generally occurs in exciting circumstances, that is, in circumstances which tend to lower the critical faculty of those present, and often actually to predispose to the reception of waking suggestions, witnesses will soon be found—even supposing complete integrity on the part of those concerned—to testify to the actual occurrence of the presentiment. Frequently other hallucinations of memory follow and other imaginary impressions are remembered which testify to the existence of the presentiment previous to the occurrence of the event in question; or, again,—and probably in the majority of cases,—present impressions are projected backwards in a form involuntarily modified to suit the presentiment.[3] Some examples will illustrate this.

"One week from to-night (Friday, December 9th) I had a vivid dream. I was in a store with a friend, selecting a pistol.

[1] Kraepelin, "Ueber Erinnerungsfälschungen," *Arch. f. Psych.*, xviii. pp. 393-409, gives two cases. For some other cases which may perhaps be classed here see v. Krafft-Ebing, *Lehrb. d. Psychiatrie*, 2nd ed., ii. p. 146; *Arch. f. Psych.*, xx. p. 337.

[2] Kraepelin, *Arch. f. Psych.*, xviii. p. 395.

[3] Cf. Bernheim, *De la Suggestion.*

My friend was purchasing the pistol with the intention of committing suicide. I seemed to favour my friend's project, and was busy helping him to pick out a suitable one. I can see the store, the pistols, and all, very vividly now. The picture has fixed itself in my mind. The following night my friend, G. Z., shot himself in a New York hotel. I did not mention the dream to any one, thinking it of no consequence. The shooting was a great shock to me, as I had no suspicion of such a thing."[1]

"Miss C.'s younger sister[2] came home from town, and began to say, 'Aunt G. is ill——' 'Stop,' said the elder sister; 'before you say another word, let me tell you a singular dream which I have had. I thought I was walking up the steps to my aunt's house, when some one met me and told me that my aunt was ill, but that it was impossible at that time to say what was the matter with her, but it would be decided very soon. I went up the steps again in an hour or two, and then was told (I think by the doctor) that there was no doubt now—it was pneumonia.' A few days after this conversation, the aunt died of acute bronchitis."

(Munich Collection, ii.) "When my mother died, January 8th, 1890 (at Donau-altheim, of influenza, at the age of 67), I was lying awake in bed, in my house at Dillingen. At 7.30 A.M. I felt myself touched through the clothes, three times, quite firmly, as if by a hand. I began to weep, because I already had a presentiment that my mother would die. I mentioned this at the time, and an hour later, on the same morning, I received the news that my mother had died that morning at 7.30. I was wide [awake], but had a slight headache. I had never previously experienced anything of the kind, and am not otherwise out of health."

Perhaps the following narrative, like a great number of cases of second sight, really belongs to the same class, though it must be admitted that the narrator may have experienced genuine sensory hal-

[1] *Proceedings Amer. S.P.R.*, p. 375. The further details there given furnish a good example of the distinctness which can be assumed by this kind of retrospective hallucination.

[2] *Ibid.*, pp. 385, 386.

lucinations. The greater number of the occurrences, however, are probably based on the kind of memory-fallacy we have been discussing.

(Munich Coll., xxix.) "I saw and heard persons speaking to me. Their appearance was mostly, I might say, grey, vaporous, transparent, yet they wore clothes, like ours. They usually warned me of misfortunes, of which I told other people, and they came to pass within eight or ten days. I also had visions, and often saw fires. After an interval, usually of from six to eight days, the house which I had seen on fire was really burnt down. The thing comes all at once, of itself, and disappears again. . . . My wife also heard knockings and felt her feet touched."

To another kind of memory-fallacy, called by Kraepelin the "identifying fallacy,"[1] many of those cases are probably to be referred, in which the narrator believes he has previously passed through the same experience, corresponding in all its details, in a dream or hallucination.

This form of qualitative disturbance of reproduction, which causes a whole situation to appear as the exact repetition of a previous experience, frequently occurs in healthy subjects, especially young and imaginative persons, and is, in adults at least, certainly to be understood as a symptom of fatigue. This is in accordance with the fact that, of the few cases observed in insane patients, several occurred in epilepsy, and the connection of the disturbance with epileptic fits has often been noted. In healthy persons it takes place at moments of weariness, when outward impressions are only perceived vaguely, as if in a dream, and the subject experiences a feeling of complete mental vacuity, though without the power of stopping the stream of vague, indistinct images hastening through the mind.

[1] Kraepelin, *Arch. f. Psych.*, p. 400. To this article belongs also the short summary which follows in the text. For the literature of the subject the student may be referred to the same passage; cf. also *Allgemeine Zeitschrift fur Psych.*, xlviii., No. 6.

The conjunction of these two disturbances points to inhibition of attention, making clear apperception impossible, and, in spite of energetic efforts of will, not allowing clearness of view to be restored at once, but only after overcoming a certain resistance. This troubling of the consciousness, though only an accompanying phenomenon, yet no doubt acts as a predisposing factor.

The attempts at explanation have proceeded on two different lines, according as the reminiscence is taken to be a real but dim recollection of actual occurrences or not. The latter is the view adopted by Neumann, who considers that the "repeated" scene is simultaneously perceived as an image of the senses and of the memory, but leaves the reason for the duplication still to seek. Anjel explains the duplication by supposing that two processes, ordinarily simultaneous, perception and apperception, which may be supposed to be localised in different parts of the brain, may—through the retardation of the central conducting process in consequence of great fatigue—be separated by a sensible interval, so that we lose sight of the inner connection between the two, and take the apperception for a figment of the imagination. Jensen similarly assumes the separation of two processes psychologically overlapping, or divided only by an imperceptible interval, and seeks the organic ground of this incongruity in the theory —championed by Wigan and Schroeder van der Kolk—of a normal parallelism of the functions of both cerebral hemispheres. In fact, if, under ordinary circumstances, every perception of each hemisphere takes place separately, and if this separate activity only fails to affect our consciousness normally, because of the complete simultaneity of all processes, every pathological or physiological disturbance of this harmony must lead to a temporary disintegration of the act of perception. Unfortunately, there are weighty objections to each of the above-named theories. But even the explanation attempted (in the other direction) by Jessen, Sander, and others, of these delusions of memory as real, dim recollections of actual experience in dreams, is not without difficulties; it might be overthrown by the mere fact that other kinds of memory-fallacies exist. This being so, a solution which it is possible to accept has yet to be discovered.

While, as a general rule, the "foreknown" scene or circumstance appears to repeat a former waking experience, in the following examples the imaginary experience is transferred to a dream. Otherwise they present all the marks of typical "identifying" memory-delusions.

One narrator states[1] that during the night he dreamed a line of verse unknown to him, and that next day this line was read, with a slight change, at a public commemoration. "I felt that something was coming which was familiar, and as he ended the line I felt that I could repeat the next one, and I did so, ahead of him. But as we proceeded, I was confounded with the fact that apparently my line would not rhyme with his. As I said 'die for,' he said 'do.'[2] I spent some minutes in trying to determine whether I liked his sentiment or mine the most." The same narrator reports also a second and later incident of the same kind.

In the above case all the characteristics of the memory-fallacy are clearly recognisable—viz., the feeling of having experienced the event (in a dream), the dim presentiment of what is to follow, the sudden cessation of identity, and the feeling of uneasiness accompanying all this ("I was confounded").

The following case is probably an example of the same fallacy:—[3]

"I thought I saw a mad dog coming up Randolph Street, and saw him attack my little eight-year-old boy, seizing him on the upper arm near the shoulder. Such was the impression

[1] *Proc. Am. S.P.R.*, p. 378.

[2] "Those love her best who to themselves are true,
And what they dare to dream of, dare to do."
—Lowell, Harvard Commemoration Ode.

[3] *Proc. Am. S.P.R.*, p. 456.

that I soon awoke, and called to my wife and told her of my dream. 'Oh,' she replied, 'it is only one of your dreams!' I told her I never, in all my dreams, had had such a vivid dream. I could not sleep any more that night, and could not shake it off." On the narrator's return from the journey during which this dream had taken place, he found that his son had been bitten by a mad dog on the same part of the arm seen in his dream.

Adaptation of an actual hallucination to the event afterwards connected with it.—But even in cases where the actual occurrence of a hallucination may be assumed, there is still the question whether its details were really identical with those presenting themselves to the memory at a later period. For it is just such "strange" occurrences, as would seem to most of us the partial correspondence of a dream or vision with a subsequent event, which show a tendency to assume within a short time a more finished, perhaps a more interesting form, which the common instinct for dramatic completeness renders plausible and natural, to the percipient's friends as well as to himself. The points of correspondence come out with special distinctness; those, on the contrary, which do not correspond drop out of sight or are assimilated to the rest.[1] Thus I

[1] Cf. Report, pp. 117 *sqq.*—from Dr. H. C.:—"In the year 1863 (I think I could find out the very day and year with a little trouble. It was a Tuesday, five days before the death of a lady whom I used to connect in my mind with my vision. But as I did not do this when I related my story in the morning after, nor till after the death of the lady, I now reject this connection as a fanciful addendum), being about twenty-six years old, I was sleeping alone. . . . As I started up and raised myself on my elbow I saw a tall lady . . . looking steadily at me with a most gentle, meditating gaze. About forty, I should say. I *now* say that I *did not at all* recognise the face." It

know a lady (a great lover of dogs) who dreamed that she was taking leave, with her family, of their estate, which had been sold for the price of 750,000 poodles. The dream was related and laughed over. A few days after her husband was approached by a land-agent with the inquiry whether he would be willing to sell his estate. As an approximate price which the purchaser, in the event of an arrangement, might be willing to give, he named the sum of 750,000 marks. This coincidence was quite sufficient to produce in the mind of the lady, a strictly veracious person, the delusion that she had not only dreamed the number correctly, but the unit of value—*i.e.*, that in her dream she had received, not a pack of poodles, but a sum of money as an equivalent for the estate. And not only the lady herself, but the greater number of her friends and relatives, allowed themselves to be fully convinced that this was the true state of the case.

follows from these words that the narrator (whom the rest of the narrative shows to have had a comparatively critical mind) during the period immediately succeeding the lady's death, not only believed himself compelled to connect the apparition with the death, but also at that time thought *that he had recognised* the figure as that of the deceased. It was only at a later period that he was able to free himself from the overpowering impulse towards adaptation of memory and to correct his memory-image.

Cf. also Report, p. 284 (case 402. 8):—A lady about to enter a carriage saw inside it a hallucinatory figure which she did not recognise. Some days later she heard of the death of a gentleman known to her, and on the receipt of this news she immediately became aware that the apparition was no other than that of her deceased friend. Her sister agrees with this opinion—"Grâce à ma description précise," adds the narrator naively!

Case 49. 5 (pp. 143, 144) is of another kind, and rightly explained by the percipient.

As in this case, the *hallucination rétroactive* is characterised by the firmness with which the percipient's faith resists all assaults, by the obstinacy with which he persists in asserting the actuality of the occurrence, and the extreme annoyance which he exhibits when any doubt is hinted as to the accuracy of his version. Many persons, not usually fanatics in the cause of truth, prefer to submit to inconvenience rather than doubt their own recollections.

The following was observed by myself: S——, a cow-herd, who had been several times hypnotised, was on one occasion when awake, some days after he had been last hypnotised, asked in a manner designed to give the suggestion, what had happened to the oxen, as they were running about the yard with no one to look after them. This (imaginary) occurrence was willingly admitted; S—— accused himself of gross carelessness; the bailiff, coming in, declared that he knew nothing of the matter, and threatened S—— with immediate dismissal in case it should really be as he represented. S—— excused himself for his carelessness, but obstinately adhered to his statement that, through his fault, the oxen were running about and had been injured.

Bernheim's descriptions of retroactive hallucinations in hypnosis show the same character,[1] which, indeed, they share with many sensory delusions—*e.g.*, in the insane. Thus it would seem that it is often easier to convince such a person that he has been mistaken in an objective sensory perception than to shake his belief in the objectivity of his hallucinations.[2]

If we keep these considerations in view we shall feel that it is necessary to maintain a very sceptical attitude towards all accounts of "veridical" hallucina-

[1] *De la Suggestion*, pp. 183 *et seq.*

[2] Compare the case of Moll's cited above, p. 245, Note 3.

tions. Not of course that we should dismiss them offhand as old wives' fables—an all too common method of dealing with them—or even doubt the narrator's good faith; but we should, so to speak, append two large notes of interrogation to each of the cases, and ask before we accept the evidence as satisfactory, first, whether the experience may not be due to a hallucination of memory; and second, supposing the vision actually took place at the time affirmed, whether the details which exactly correspond to the details of the real event may not have been gradually developed afterwards by a process of sophistication through which the hallucination came to appear "veridical." And even if the second objection alone should hold good it would be sufficient in itself to invalidate any conclusions from the veridical cases reported, seeing that it would be impossible to establish their veridicality.[1]

The Coincidence not always Proved.—If the above objection applies to all the cases in the collection alike, there remains yet another question to be asked in individual cases: whether, to wit, granted the veridical character of the hallucination, the experience was really coincidental; and, in spite of all the precautions taken by the committee, it seems to me that this is very doubtful. Surely

[1] Of course I should except cases in which, for instance, the percipient communicated the details of the hallucination, the time of its occurrence, etc., in a letter to a friend before hearing of the corresponding event. In this respect, however, the "best attested" narratives in the Report are in very poor case, for when notes are said to have been taken or letters written at the time, they have been either lost or destroyed, or, if extant, are of such a kind that neither the details of the hallucination nor the exact coincidence can be proved from them.

cases like 418. 4,[1] 425. 10,[2] and 307. 20,[3] ought to be excluded from the number. The reported correspondence, so frequently appealed to as proof by the narrator, between the certified date of the death and the time of the hallucination, proves nothing. For of course the percipient, assuming a discrepancy between the dates, would transfer the hallucination to the day of the death, and not the death to the day of the hallucination.

Though it would be interesting to take a group of cases and analyse them as regards the probable genuineness of the coincidences, I shall not attempt to do so here, as it would take up too much time to weigh the separate items of evidence. But if I have only briefly referred to this source of error it is not that I consider it irrelevant or of secondary importance.[4]

Arguments against the Comparison of Coincidental and Non-coincidental Waking Hallucinations.—But

[1] The percipient, Mr. Sims, is about six years out in his reckoning, and so is his wife. This is the more remarkable since the event must have occurred (Mr. Sims was about twenty years old at the time) very soon after their marriage, and therefore at a time which one would think hardly likely to be confused with a period six years afterwards.

[2] Mr. A. Sherar, the percipient, struck his interviewers "as having a very vivid recollection of his experiences." Nevertheless, his statement (in Case 2), "he believes he made out the coincidence of time," and his somewhat remarkable vagueness about the date of his own affianced wife's death ("about July 1873?"), furnish sufficient ground for excluding the case.

[3] Here the coincidence between the hallucination and the death was not discovered till some three weeks after the event. The mistake about the day of the week makes it very doubtful whether such a coincidence was really proved.

[4] Compare, for instance (*Proceed. American S.P.R.*), the exhaustive criticism on *Phantasms of the Living*, by Pierce, and Gurney's rejoinder.

even supposing that the bulk of the narratives are correct, we are still not entitled to assume that the numbers of the coincidental and non-coincidental cases are at all comparable.

In the first place, it is very difficult in such an inquiry to guard against unconscious bias on the part of the collectors, who might by the special interest attaching to the coincidental hallucinations be led unintentionally to select them. The committee have adopted various precautions against such selection, but, nevertheless, it is shown that of the coincidental phantasms of living persons 25 per cent., and of the non-coincidental cases only 8 per cent. were known beforehand to the collectors.

Moreover, in regard to another point, it is clear from the tables themselves that the percentage must be considerably reduced. Thus the table distinguishes, first, hallucinations which occurred within five years of the date at which they were communicated; second, those which occurred more than five years but not more than ten years before they were reported; and third, those which occurred at a still earlier period.

In the last	5 years	out of 84 cases	5	coincided with a death	=	5.95%
,, preceding	5 ,,	,, 50 ,,	5	,,	,,	10.0
More than	10 years ago	99 ,,	55	,,	,,	55.0

These figures furnish on the face of them the most obvious confutation of the view of the English authors,[1]

[1] Gurney, *Proceedings of the American S.P.R.*, pp. 176, 177. "All that I have assumed is, that a hallucination of the waking senses so distinct as those which have occurred in the coincidental cases is likely to survive in the mind on its own account, or at any rate to be recalled when the person who has experienced it is put into the right attitude for recalling it by being asked a definite question on the subject." Compare *Phant. of the Living*, ii. pp. 10, 11.

a view which is of course assumed in all calculations of the kind, namely, that a hallucination persists equally long in the memory and is as readily recalled in reply to a question, whether the experience made but a slight impression on the percipient or affected him deeply, as would be the case, for instance, if the hallucination had been found to coincide with the death of a near relative or friend. If such a supposition were justifiable; if we could leave the memory-factor out of count in fixing the percentage, we should, if we adopted these figures, either have to assume that the coincidences are enormously under-rated, or that the death-rate among the favoured mortals who have experienced "veridical" hallucinations is nine times less than the death-rate of those whose hallucinations have, so to speak, prophesied falsely.

Thus there is nothing for it but to explain the circumstance that the proportion of veridical hallucinations reported as occurring more than ten years ago, is nine times as great as the proportion reported as occurring within the last five years, as indicating that such striking experiences continue to be remembered when a multitude of other hallucinations have passed out of mind. To compare the numbers of coincidental and non-coincidental hallucinations is to compare the incomparable, and the attempt must be abandoned at the outset as fruitless.

The writers of the Report—influenced, it is true, by other considerations—have sought to turn the point of this objection by multiplying the whole number of cases reported by 4. To go into the reasons for adopting this plan would lead us too far,[1] but it seems

[1] See Report, pp. 62-65; pp. 246 *et seq.*

to have a good deal in its favour.[1] Nevertheless, it does not appear to me that the assumptions on which the calculation rests are well founded.

A "veridical" hallucination is to be included among the "coincidental" cases even when it appears probable that external circumstances have produced in the corresponding nerve element-groups the tension favourable to the occurrence of hallucination.[2] There is therefore no objection to be raised when we find amongst the cases reckoned as coincidental, narratives in which the shimmer of a reflecting surface formed the occasion for the hallucinatory emergence of a subconsciously perceived "shiny black waistcoat" and an individual subconsciously associated with that impression,[3] or where the reflection of light in a mirror was perceived as the apparition of a friend who was seriously ill, and with whom the percipient had been sitting up the night before.[4] In another case certain objective sounds which were interpreted as footsteps, and a short conversation with one brother, led to the apparition of another brother passing through the room.[5] There is of course nothing to be said against the inclusion of these cases among the

[1] If the similarity of the figures, which seem to afford a foundation of "natural law" for the calculations, is not fortuitous. "But where such small numbers are involved [and the numbers are very small indeed!] how can one be sure on this point?" (James, *Psychol. Review*, ii. p. 74).

[2] Excluding, of course, cases where sensory impressions from the death-scene itself may have aroused the corresponding brain elements; for instance, where sounds of mourning from the death chamber, even if only subconsciously perceived, may have suggested that the event had taken place.

[3] Report, p. 237, Case 571. 14.

[4] *Ibid.*, p. 237, Case 725. 6.

[5] *Ibid.*, p. 239, Case 385. 20, and p. 227, Case 620. 5.

coincidental ones, since the question is the *coincidence*, and even such a simple case as my seeing in some stranger's face the face of a friend (who was dying at the time) might fairly be included; the problem at issue is the coincidental character of the phenomena, and that cannot be explained away by "mistaken identity."

But if such cases may be legitimately reckoned among the "coincidences," similar non-coincidental cases ought not to be ruled out on the other side, but this is what the committee have done by reckoning them as "suspicious cases." If the cases excluded on this ground were taken into account in allowing for forgetfulness, the multiplier would be not 4 but $6\frac{1}{2}$. Moreover, we must take into consideration that such cases would seldom be reported, that *the great bulk of false perceptions*, mistakes of identity, were excluded by the form of the question in the circular, which admitted such phenomena only as could not be explained by an external physical cause.

This consideration would in itself be sufficient to demonstrate that the percentage of "veridical" hallucinations was much too high. But even when all waking hallucinations are included the proportion is still considerably too high, and the reason is that all these calculations, according to my view of the nature of false perception, are vitiated by a fundamental fallacy. It is not merely that hallucinations which made little impression upon the mind soon fade from the memory, or that there is no legitimate ground for separating "illusions," in Esquirol's sense, from hallucinations; *but there is absolutely no distinction, either theoretic or practical, to be drawn between the*

sense deceptions of the dream-state and those of the "waking-consciousness."

To prove the practical impossibility of such a distinction, I should have to discuss all the cases in the Report, an undertaking manifestly impossible here. But if I take for examination some sufficiently large group of cases which have been classed together in the Report, on other grounds, I shall at least avoid the error of generalising from certain selected narratives which tell in favour of my conclusion, the more so since the series of cases which I propose to analyse are those included in the chapter on Telepathic Hallucinations (Report, pp. 207-241), that is to say, are those which the committee consider "on the whole the best evidentially."

The objection will perhaps be raised that, in my attempt to indicate the ground for assuming that these experiences occur in the dream-state, that is to say, while the percipient is drowsy or half asleep, I have attached too much importance to mere casual expressions and turns of phrase. But when we consider how rapidly the details fade out of mind (as already shortly indicated on p. 104), and also the gradual change which the memory-image undergoes, both from the action of time and from frequent repetition, so that at last the idea of having been fully awake at the time becomes firmly fixed in the percipient's mind, we become convinced that the *slightest* indications of the presence of such a state —which may be gathered from the percipient's description of his feelings and surroundings at the time—are worthy of consideration. It is a proof of the honesty of the witnesses, and of the care with which the members of the S.P.R. have investigated

individual cases, that in these very narratives, all reasons to the contrary notwithstanding, there are yet so many hints of this kind to be found.

I shall now proceed to discuss the separate cases, all of which are described in the Report as "death-coincidences."

1. (425. 12.) *Mr. S.* reports the apparition of his aunt, which took place *seven months* previously; the phantasm seemed to say "good-bye." The following details were obtained by Prof. H. Sidgwick in an interview with the percipient: "He had gone to bed *early*, eight-thirty, or a little later, and *between nine and twelve* he *woke up* and saw . . . In the *early morning* he told his wife: 'I have seen Aunt P——, I am sure she is dead.' . . . He knows it was before twelve o'clock that he had the vision, because he used to get up at night and give the child something."

The fact that the percipient mentions his going to bed early would seem to indicate that this was not his usual habit, and we may therefore infer that he was unusually tired. The vagueness as to time (in a case so recent) is a characteristic mark of the drowsy state. Considering the very friendly relations between the percipient and his aunt (to whom he used to write about once a month), it seems hardly likely that Mr. S., if he were really awake, should have let the whole night go by without communicating to his wife his strange experience and his firm conviction that his aunt was dead, but should have quietly turned round and gone to sleep again. Perhaps the whole experience was a dream, a morning-dream even, which, through an illusion of memory, was transferred to the first sleep. It is further to be noted that a light was burning in the room all night, a circumstance of course favourable to visual dreams. We shall encounter this fact frequently.

2. (381. 4.) *Mrs. T. P. Smith* was *roused from sleep* by the vision of an acquaintance, who told her that she had "passed away." In this case the percipient was, by Mrs. Sidgwick's account, "probably only half awake." In a further fuller account Mrs. Smith states that the figure appeared twice, and she is "quite sure that she was awake" the second time. Nevertheless, the presence of the dream-state is clearly indicated by the uncritical spirit in which the apparition (and its strange utterance, "I have passed away") was received and taken for a real person, though the acquaintance whom the figure represented was then living at a distance, and expecting her confinement; and further, the characteristic *absence of any feeling of astonishment.* "She felt no fear nor sense of the supernatural, only anxiety to question further." The suggestion that she was dreaming does not seem at first to have been very emphatically repudiated by Mrs. Smith. To her sister's remark that it must have been just a very vivid dream she merely replied, "Well, it was a very vivid one then." In the sister's account, Mrs. Smith is represented as waking her up "to tell her she had dreamt," etc. The fact that the percipient gets out of bed does not necessarily indicate that he or she is fully awake. This is shown in a parallel case, Report, p. 72.

3. (362. 21.) *Mrs. Baldwin* had a complicated vision of the death of an uncle to whom she was much attached. This case is twenty-five years old, so it is naturally difficult to obtain details, but still a circumstance, to which we have referred already as not unimportant (p. 71), is indicated in the words, "One *morning* at about *four o'clock*, as I was *sitting in bed with my baby*," etc.

4. (147. 23.) *Madame Obalecheff* saw the apparition of her brother-in-law. A maid-servant shared in the hallucination. To begin with, this case is very old, over thirty years. Nevertheless, the circumstances described are precisely those likely to induce the dream-state. It was eleven o'clock at night. The room was only dimly lighted by a little lamp burning before the ikon, and one candle beside the bed. The husband was sleeping quietly in the same room, and the lulling sound of the sleeper's breathing would add its quota to the drowsy effect. The sleepy maid-servant, just aroused by her mistress's call, had settled herself on the floor beside the bed. Madame Obalecheff herself was propped up in bed suckling her infant, probably aroused

by the touches of the child's lips, her thoughts brooding more or less dreamily over it ("Je ne pensais alors rien qu'a mon fils"). Moreover, the experience is accepted in a way which indicates the characteristic *absence of the critical element:* the brother-in-law lived at Iver, Madame Obalecheff in Odessa; but speaking of herself, Madame Obalecheff says, "Cette apparition ne m'effraya nullement," while the maid-servant is described, in romantic contrast to her own calmness, as "trembling with fear." In fact the narrative conveys, on the whole, the impression of having in the course of time been worked up into dramatic completeness. It is, however, only given in translation.

5. (579. 24.) This case is given above on p. 97.

6. (215. 9.) *Miss J. E. L.* was *lying awake in bed between six and seven o'clock* in the morning. A friend suddenly appeared and kissed her (hypnopompic hallucination). The account is extremely condensed.

7. (630. 5.) *Mr. T. H.* saw in the night the figure of his step-brother pass through the room. He had been asleep and was waked by a "rattling noise at the window," and wakened his other step-brother, who told him to go to sleep again; a few minutes after the phantasm appeared—according to the account, that is to say. This case, which is about fourteen years old, is easily explained as a hypnagogic hallucination, whose content was suggested by the *objective noise*, which was perceived as "footsteps," and possibly by something in the foregoing conversation which suggested the absent brother. The corroborative account furnished by a witness does not entirely bear this out, but may be taken as the more romantic, and, being second-hand, the less trustworthy version of the case. According to this version, Mr. J. H. saw his brother, not walking, but "in a kneeling position."

8. (83. 21.) See above, p. 98.

9. (307. 20.) *Mrs. Murray*, "*awaking suddenly at night*," saw a man in naval uniform disappear behind a curtain. This case, which, by the way, is more than twenty years old, ought to be excluded from the group of cases considered "the best evidentially," because of the vagueness of its date.

10. (418. 4.) The apparition was seen *soon after going* to bed. See above, p. 287, note 1.

11. (532. 12.) The apparition appeared in the same circumstances as in the foregoing case.

12. (730. 24.) See above, p. 99.

13. (458. 18.) *Miss S. R. R. saw her sister's form lying near her the whole (!) night.* The dream-state is very clearly indicated. (Compare below, Appendix I., case 1. 13.) "My thoughts were very much with my sister, who was dangerously ill . . . and, just as I lay down, I plainly saw her lying dead beside me. . . . I scarcely slept all that night, and there my sister lay beside me, and I was glad to have her, knowing too well what the contents of the telegram would be next morning." The dream-character of the experience is also brought out in Professor Sidgwick's report of his interview with Miss R.: "What she saw *was* first 'something white' on a long cedar chest beside her bed. Then, looking closer, it *seemed* to her to be her sister in bed; the chest *was* plain, bare wood, but it *seemed* just like a bed." The presence of the dream-state could hardly be indicated more clearly. Miss R. had had similar visions after the death of her mother. "For three months after her death she used to come to me almost nightly, after I had retired to my bedroom."

14. (645. 11.) *Mr. Beer* saw a recurrent apparition of his father. The indications in this case are almost as clear as in the foregoing one, to which it forms a parallel. The impression of having seen the phantom of his father first on the platform at a concert before he saw it in bed is probably due to a mistake; for when the vision appeared to him in the night it startled him enough to make him get up and wake the footman, yet he appears not to have thought it necessary to communicate his strange experience at the concert (when he supposed himself to be fully awake), though his father appeared on the platform at *frequent* intervals *the whole time the concert was going on.*" Finally, he remained lying quietly in bed, although he says, "on returning to my own room I again saw the figure of my father leaning over me as I lay in bed" (thus the vision came again *only* when he had returned to bed), "and he remained on and off through the night." He must have had exceptionally good nerves!

15. (725. 6.) *Dr. B. G.*, who had spent *the whole of the previous night* watching by the sick-bed of a friend, saw, at about 3 A.M., an apparition of this friend passing in front of a looking-glass. (Was there a light in the room?) The percipient was *fifty-seven years of age* at the time.

16. (385. 20.) *Mrs. C. S.*, after *sitting up the whole night* with her sister, who was ill, saw *at* 5 *a.m.* the apparition of her grandfather, whom she knew to be seriously ill at the time. (A hypnagogic hallucination.)

17. (579. 25.) *Mrs. A.* was *lying in bed* at ten o'clock in the evening, after a journey of one hundred versts into the country. That it had been slow and tedious, and therefore probably not accomplished without some fatigue, seems indicated by the early start for the return journey. We may therefore conclude that she was feeling tired. The bailiff's mother was making up a bed for herself in the same room, and while she arranged her pillows, with *her back turned to the percipient*, she went on talking—of nothing very exciting apparently, and from the talker's position her voice would probably reach the hearer as a *monotonous, murmuring sound.* Suddenly the percipient had a vision of a hand. (Compare Report, p. 115, case 692. 2, hypnagogic hallucination.)

The cases which follow bear a strong resemblance to crystal-visions. These latter phenomena are indeed often regarded by the percipients as occurring in the normal consciousness. Nevertheless, this assumption is distinctly opposed to the following account, by a friend of "Miss X," the author of *Recent Experiments in Crystal-vision*, of her own observations in connection with the latter's visions.[1]

"On January 29th, X. and I were dressing to go [out] when I suddenly noticed that her eyes were *fixed on the window*, in a manner I know well and have *long* learned to *associate with something 'uncanny.'* I waited till her face regained its normal expression, and then asked what she had seen or what she felt. She turned to the clock, and said in a *dreamy, far-away tone* . . ."

I have repeatedly used this example to illustrate my point, because it shows that so good an observer as "Miss X." may think herself fully awake, although

[1] *Proceedings of the S.P.R.*, 1895 (March), p. 132.

an onlooker finds obvious symptoms of a dreamy state. In the three following cases from the Report, which, as I have said, have many points in common with crystal-visions, a similar state may be presumed.

18. (571. 14.) *Mrs. Belcher*, who appears to have experienced other visions in *reflecting* surfaces (she mentions one other), was sitting in the *dusk* at supper with her mother and aunt in the dining-room, with her back to the window and facing an old-fashioned side-board (the polished surface of which naturally reflected the window opposite). "*I felt as if I could not take my eyes off him*," she adds, speaking of the phantasm, and the feeling she describes is characteristic of the dream-state.

19. (425. 10, case ii.) *Mr. Alex. Sherar*, a sailor, saw *reflected* in the ship's compass the face of his betrothed (see above, p. 287, note 2, for criticism of this case).

20. (328. 15.) *Dr. A. T.* saw a cloudy figure (probably entoptic) which, when he gazed at it intently, revealed itself as the phantasm of his father. *Circumstances:* "Assis seul . . . sous l'influence de très tristes pensées: . . . Je n'ai rien fixé." *Absence of critical faculty:* In spite of the *gradual* development of the phantasm, the percipient declares that he was "plutôt incliné à croire à la présence réelle de mon père qu'à une 'apparition.'"

21. (191. 3.) If, indeed, a hallucination took place, and not a mere error of memory, in the following case, which is nearly sixty years old (see below), it may be bracketed with the case just quoted. "I was leaning in a *listless* sort of way against the kitchen table, *looking upwards* to the ceiling, *thinking of nothing* in particular." Thereupon an apparition developed itself gradually, probably from an entoptic nucleus.

I repeat once more that I by no means assert that these hints and indications suffice to prove in each of the cases under consideration the presence of a decided state of sleep-stupor, or even of a slight degree of drowsiness. In some cases they do indicate such a state almost with certainty, in the

greater number they suggest it, and in all they raise the suspicion. That in the other 6 cases (22.22 per cent. of the whole number) none of these suspicious circumstances are reported is of course attributable, in the first instance, to the fact that no questions were asked calculated to elicit them; secondly, to the long period of time which had elapsed, 11 years in case 42. 17, over 14 in case 383. 24, about 10 in case 379. 24, exactly 11 in case 422. 25. and about 27 in case 452. 10. Case 61. 22 is the only comparatively recent one (about two years old when the communication was made).[1] It is all the more remarkable then that in other old cases where no leading questions were asked so many suspicious circumstances are to be found. And we are not dealing here, be it noted, with casual "borderland" cases, hallucinations occurring in the transition period between sleeping and waking, but with the 27 cases of "waking hallucinations" selected as "the best evidentially!"

It is the same thing over again. Hallucinations which are either in the first instance distinguished by strong emotion, or are stamped upon the mind by the occurrence of an event corresponding to them, outlast hundreds which, because they make no special impression, soon pass from the memory. But this peculiar state of feeling at the time, and the vividness of the impression left on the memory, are among the causes which lead the percipient to feel, "I must have

[1] The fact that the "suspicious cases," *i.e.*, cases in which there are grounds for supposing mistakes of identity, etc., decrease in frequency as the period between the date of the experience and the date at which it was reported lengthens, of course admits of the same simple explanation—the tendency of "suspicious circumstances" to drop out of mind in the course of time, and their consequent omission from the narratives.

been awake." *This feeling*, however, *the one distinctive feature of the so-called waking hallucination, is deceptive.* This can be demonstrated *ad oculos* in the lighter stages of hypnosis, and objective indications of it are to be gathered, as we have just seen, from the reports.

Thus we find that it is impossible, in practice as in theory, to distinguish between waking hallucinations and those of sleep. And this again points to the chief defect in the census question, which restricted the inquiry to "waking hallucinations," while from the nature of the case "coincidences" *must* reach a higher proportion in this class than chance would account for. The correct method would be to endeavour to ascertain the proportion of all death-coincidences amongst hallucinations, both of the waking and the sleeping state. The result could of course only be estimated approximately, but that such a comparison would prove very unfavourable to telepathy may safely be assumed from the fact that with increased practice and careful self-observation the number of remembered dreams is greatly increased.[1]

Association of Ideas.—My first objection was directed against the material collected, and aimed at showing that, in view of the probability of a delusion of memory, it must remain an open question whether in each case a sensory deception really occurred; or, again, even if the hallucination were really "veridical"—*i.e.*, if its content corresponded to the actual event—whether it coincided in time. In other words, the objection was

[1] See Nelson, "A Study of Dreams," *American Journal of Psychology*, vol. i. 3.

directed against the postulate which underlies the calculations of the Sidgwick Committee. But another criticism remains to be made: *no matter how great the number of coincidences, they afford not even the shadow of a proof for telepathy.* A very crude illustration may serve to show what is still to be urged against the telepathic nature of the coincidence.

Suppose A. and C. are sleeping in a room without a fire on a frosty winter night, and that the window has not been properly fastened, so that the cold night air is streaming into the room. B. goes past A.'s house in the piercing cold outside, and it occurs to him to try a telepathic experiment. He seeks to transfer to A. the feeling of cold which *he* is then experiencing. Having done what he thinks necessary to attain this end he hurries home, and on the following day at the midday meal, which A., B., and C. are in the habit of taking together, C. gives him the following account of his nocturnal experiences:—"Last night I was wakened by loud groans from A. His bed-clothes had slipped off, leaving him exposed to the cold, and he was dreaming of an expedition to the North Pole, and imagined himself attacked by a polar bear! That shows how dreams come about; it is easy to see that A.'s dream resulted from the cold to which he was exposed." Would B. object to this common-sense explanation? "Not so, my good C., *I* transferred my feeling of cold to A. telepathically, hence the dream."

If the elements (discussed in Chapter VI.) corresponding to the specific content of a given hallucination are to hand, it is not possible to regard the case as though it owed its existence not to these elements but to quite another chain of causes. The

whole argument of the Sidgwick Committee is valid only so long as it is dealing with coincidences in which the veridical content cannot arise from normal known factors.

Now, the writers of the Report appear to assume that they are dealing in by far the greater proportion of coincidences with hallucinations whose specific content could not be brought about in the normal way, especially as they have indicated that excitement and anxiety about the person represented by the phantasm and "suggestion" were of importance only in a small proportion of the cases.[1] But these are not, after all, the weightiest factors: one which is of much higher importance, to wit, the *association of ideas*,[2] has been left altogether out of account. It must indeed be conceded that it is not easy to trace the connection of ideas in the hallucinatory state, and to show how, when dissociation is

[1] See Report, chapters ix. and x., where the evidence for the influence of anxiety, nervous strain, expectancy, and suggestion is discussed.

[2] Compare above the crystal-visions of "the old vicar," p. 68, the "Jewish Elder," and the "pentagram," p. 69; the Rigi-kaltbad incident, p. 197; Münsterberg's experiments, Binet's "verbascum thapsus" story, p. 198, etc. One other case, to which I have already referred briefly above, I should like to quote here more in detail. The following account is slightly abridged from the Report, pp. 143, 144:—". . . One night I saw a woman come through the door. . . . I distinctly saw her features. . . . She had on an old-fashioned bonnet and an old-fashioned caped cloak, and she was carrying a basket in front of her, such as country women carried their husbands' dinners in. . . . *A great hurricane was blowing.* I was dreadfully disturbed and hysterical next day—the impression so vivid and yet unable to say who it was. About a week after the revelation came. . . . All at once I jumped up, saying, 'It is Mrs. Beasant.' Mrs. Beasant was the pretty young bride of a farmer with whom, when about ten years old, we used to go and take tea at a farm two or three miles from the vicarage.

present, they may lead to a particular hallucination, just as in the normal state they evoke a specific mental image. We are not all gifted with the special faculties of an August Dupin.[1] Besides, in following up these delicate clues, we are handicapped by our slight knowledge of the hallucinatory personalities, by our ignorance of facts about them which would indicate the subtle points of connection which lead up to the hallucination. But though these factors can seldom be traced, I believe I have succeeded above in indicating some of them.[2] This point is, however, of minor importance, since their existence is to be presumed, and it is not their *presence* but their *absence* which needs to be proved—a task which falls, of course, to the share of those who seek to put a new causal nexus in place, or alongside, of the normal elements.

Naturally, this proof is not forthcoming, and in its

One day she went with her husband's dinner as usual, and he was felling a tree. She passed the wrong way, and *the tree fell on her* and killed her. I remember watching her funeral . . . and the anguish of spirit at her death, but never remember speaking of it or the circumstance since. The day before *a nurse of the name of Beasant had disturbed and annoyed me.* A few months before a large elm-*tree had fallen* in our garden and partly on the house. *A hurricane was blowing* at the time, and I remember thinking 'what a lucky thing that tree can't fall on the roof.' This narrative shows with special clearness how the content of the hallucination may depend on a train of ideas started in the first instance by some sensory impression—in this case 'the blowing of the hurricane,' and how impossible it must be for the observer to trace the windings, turnings, and doublings of individual thought through a labyrinth for which he has no clue."

[1] The amateur detective in Edgar Allan Poe's tale, "The Murders in the Rue Morgue."

[2] See the discussion on p. 219 above on the influence of subconscious impressions, etc., and the references to cases in the Report there given.

stead we are asked to accept as evidence the disproportionately high number of coincidences. Prof. James states the argument briefly as follows:—

"We have three orders of frequency in hallucinations to consider, that of hallucinations at large, that of hallucinations of persons, and that of dying persons. These may be caused by their respective objects, or may come at 'random,' their causes lying exclusively in the subjective cycle. The point is to see whether anything in the frequency can help us to decide which of these alternatives is the true one. . . . Obviously, if persons do not cause hallucinations of themselves, the hallucinations of persons should be *no more* frequent among hallucinations than persons are frequent among all the things that may become objects of hallucinations; whilst, on the contrary, if persons, and persons alone, do cause hallucination, then hallucinations of persons *should* be relatively more frequent than other hallucination, because the causation by the real outer object would be simply added, for this class alone, to the random inner causes that produce hallucinations in general. Similarly, if the deaths of persons do not tend to cause hallucinations of those persons, the hallucinations[1] of the dying should be *no more* frequent among hallucinations of persons than the dying themselves are frequent among persons; whilst if, on the contrary, the dying, and the dying alone, among persons, do cause hallucinations of themselves, then these hallucinations should be more frequent among hallucinations of persons than the dying among the whole population of persons. This latter ratio is what the Sidgwick Committee finds realised in fact, hence its conclusion that the dying do cause hallucinations of themselves."

I must beg to differ! Such a conclusion cannot be drawn as long as it is not proved that there are hallucinations which are independent of "random inner causes." As long as this is not proved, that is to say, as long as the normally induced images must be provisionally accepted as causes, the conclusion

[1] *Psychol. Review*, II. i., pp. 70, 71.

drawn from the relation of coincidental to non-coincidental cases must be as follows: "Out of a group of 20,000 persons, to take round figures, 2000 hallucinations are reported, of which 500 are realistic apparitions of human beings, and of these 50 are coincidental. As these coincidences could only have occurred in a proportion of 1 : 19.000, it is to be concluded that each 20,000 persons have had 19.000 × 500 = 9.500.000 hallucinations, dreams, etc., of realistic human beings." That is to say, that instead of inferring from the coincidental cases a specific causation, we should, on the contrary, infer from the number of coincidences, and according to the probability-factor, how many hallucinations may be conjectured to have occurred in a given group; we should use, to multiply the hallucinations, a factor which would balance the various sources of error, forgetfulness, the misleading form of the question, etc. (The multiplying factor would then certainly have to be somewhat higher than the modest *4*.)

A Typical Case.—At the conclusion of this discussion I will give in full a case where the association of ideas may be traced, and where the presence of the dissociative state was proved, although, in the classical way, the percipient felt wide awake at the time, and the coincidence between the "waking hallucination" and the death of the individual whose phantasm it represented would certainly have been established if objective proof had not been forthcoming to show that the whole experience was a dream.[1] Only the accidental discovery of this *pièce de conviction* distinguishes this case from the analogous cases of the Report, which it may help to elucidate.

[1] *Journal of the S.P.R.*, No. 56, vol. iv. pp. 12 *et seq.*

From Mr. Pratt, Camden House, Lower Merton, Surrey.

December 13th, 1882.

On December 31st, 1856, I, Thomas Pratt, was residing at, and carrying on the business of a clerical tailor, etc., at 50A Cambridge Street, corner of Warwick Street, Pimlico, the house at that time being known as Oxford House, Cambridge Street. Mr. Gleddos, a young curate of St. Barnabas' Church, Pimlico, came to me to pay his bill and order a new clerical coat about seven o'clock in the evening, saying he was going away for a short time, and *he wished the coat to be ready to fit on by the time he returned. He was in a great hurry*, having several calls to make before evensong, which was at eight o'clock. He did not give me time to finish receipting his bill, but took it away with only the word *Rec.* written on it and left the house immediately.

I was busy making a clerical coat that was wanted the next day, and had decided to sit up to finish it. I was accustomed to work all night frequently, and continued working at the coat after my wife and family had retired to bed. *I kept on working and thinking about my order*, planning it out in my mind, when suddenly Mr. Gleddos appeared at the corner of the board on which I was sitting, and at the same spot as he had stood in the evening, and looking just the same as he did in the evening; *the gaslight was between us.* At that moment the room door opened and he vanished. The fright was so great, I felt my hair go stiff up on my head. I had leaped from the board and looked outside the door, but saw nothing of him. Creeping upstairs as best I could, my knees shook so violently I did not know what to do, but got into bed and covered my head over with the clothes and told my wife what had happened. I had left the gas burning, and when I got up felt very unsettled, and could not begin to work. About nine or a little after Father Lyford[1] came to me, bringing the partly receipted bill in his hand, and inquiring if I knew anything about what was written on it, as Mr. Gleddos was found dead, and the bill was on the top of the drawers in the bedroom where he had died. *I then told him what I had seen in the night. He seemed very much shocked, and told me not to talk about it.*

[1] The Rev. Charles Lyford was curate at the same church, but was called Father by those who knew him best.

As the day went on and I became more calm, I commenced to finish the coat. Now this will, I think, be the most important part of my ghost story. I had finished both halves of the coat, and only the back seam remained to be joined. It was this middle seam I was working at, and had sewn up to between the shoulders when Mr. Gleddos appeared, and here I found my needle as I had left it. *As I was about to begin, I was surprised at the last part of the back stitching for hem; the stitches were all shapes and not one alike. This convinced me that I had been asleep, although my hand had used the needle at the same time.* Having convinced myself it was a dream, the door coming open had woke me from my sleep, which could not have been altogether more than half a minute.

The door of the room was in the habit of coming open with the least vibration caused by wind, and from these two circumstances I came to the conclusion that I had dreamed of seeing him only. Had not these things come to my knowledge in this way as I have described them, I should have believed I had seen a real ghost, and nothing would perhaps have convinced me to the contrary. But I feel quite certain I did not see him with my eyes I work by, although at the time everything appeared to favour the belief of an apparition.

THOMAS PRATT.[1]

Some other Alleged Proofs of the Telepathic Character of certain Hallucinations. Collective Hallucinations.—There are, however, other phenomena besides coincidental hallucinations which are adduced in proof of telepathy, of which the most important are the so-called "collective" hallucinations. This

[1] I cannot agree with the explanation suggested in the *Journal*—*i.e.*, that the phantasm was an *after-image*. It is apparent that a series of factors likely to suggest the content of the hallucination were present; the sudden bursting open of the door by the wind probably repeated the sound made when Mr. Gleddos entered the room ("he was in a great hurry"); the percipient's thoughts were busied about Mr. Gleddos' order; perhaps, also, the glare of the gas-lamp when the percipient lifted his head and glanced in the direction of the door, as he had glanced when Mr. Gleddos entered ("the gaslight was between us"), acted as one of the suggestive influences.

term, however, must not be understood to include hallucinatory phenomena affecting great crowds of people, since it is admitted that "popular" or "epidemic" hallucinations are not telepathically caused.

Although such phenomena are not exactly of frequent occurrence, yet a series of more or less trustworthy accounts exists. Thus we find in 2 Maccabees v. 2, 3, "Through all the city, for the space almost of forty days, there were seen horsemen running in the air, in cloth of gold and armed with lances, like a band of soldiers. And troops of horsemen in array, encountering and running one against another, with shaking of shields, and multitudes of pikes, and drawing of swords, and casting of darts, and glittering of golden ornaments, and harness of all sorts." These apparitions are said to have preceded the plundering of the temple at Jerusalem by Antiochus, and Josephus also narrates that portents of the same kind appeared before the destruction of Jerusalem by Titus. Perhaps these and similar cases might be referred to peculiar atmospheric and meteorological conditions. Thus the astronomer Heis has explained the army seen at Büderich on January 22nd, 1854, as arising from a fog-bank and mirage.[1]

Such an origin is also indicated by the circumstance that these apparitions are often mentioned as showing themselves at sunset, after a thunderstorm. Thus, in September 1680, at Chemnitz, a protocol was drawn up from the sworn testimony of witnesses, who asserted that immediately after sunset they had seen

[1] Cf. Jahn, *Astronomische Unterhaltungen* (1854), Nos. 11 and 12; Fechner's *Centrlblt.* (1854), No. 24.

armies fighting and firing at each other in the sky. In the summer of 1571 many inhabitants of Prague saw a visionary troop of horsemen enter the New Town after a heavy storm.[1] Perhaps Braid's[2] narrative of a delusion affecting a number of people on the banks of the Clyde below Lanark, in the year 1686, may be explained in the same way. These persons collected on several successive days in that place, and saw the ground and the trees covered with bonnets, guns, and swords, while at the same time one company of soldiers after another marched along the river bank, in such a manner that one company passed through the other, whereupon the soldiers fell to the ground and disappeared. Immediately afterwards new companies appeared, marching in the same manner. According to the account which has been handed down, two-thirds of the persons present testified to their conviction of the reality of these apparitions, and this conviction was expressed not only in their words, but in the dread and terror shown in their countenances, which struck even those who had seen nothing of the warlike spectacle.[3] So early as 1785 the appearance of spectral soldiers on several days in January and February, at Ujest (Silesia), was explained by mirage, which rendered visible a detachment of troops marching to the funeral of a certain General von Cosel. The narrative given in the English work of Ottway[4]

[1] Horst, *Deuteroscopie*, ii. (1851).

[2] The original account is to be found in the *Biographia Presbyteriana* of Patrick Walker, the Covenanter (Edinburgh, 1827, vol. i. p. 32).

[3] Similarly in 1655, in Upland, Sweden, many people saw a fight at sea and one on land take place simultaneously, and a month later a funeral procession.

[4] *The Spectre*, pp. 382: "Very Singular Appearance of a Vision."

might be similarly interpreted. It relates to the vision of two Scotsmen, near Inverary. They saw a company of soldiers in red, driving in their midst an animal like a horse. When the two percipients had changed their standpoint, and looked again at the place where they had seen the vision, it had disappeared. But presently they saw a man coming towards them, who, when questioned, knew nothing of the soldiers, but who was leading a horse, in which they thought they could recognise the animal which they had previously seen in the vision.

In other cases strange and mysterious noises may furnish the material for "epidemic" auditory delusions. Thus Studer[1] gives the following narrative:—"Seefeld (a mountain 4,600 feet high, on the eastern side of the Sohlfluh, Canton Bern) is said to be haunted by spirits. Wyss (*Reise im Berner Oberland*) relates that, according to a legend current among the peasants, the quantity of water in the Beatenbach—a brook emerging from a cave on the shores of the Lake of Thun—is connected with a strange sound like thunder heard on the Seefeld Alp, as though it came from the further side of the Beatenberg. This thundering was called in the neighbourhood 'the muster on Seefeld,' and has been heard at a distance of several miles, resembling the file-firing of several companies, mingled with the sound of cannon. It is said to be heard at very regular intervals, and to be invariably followed by a rise in the waters of the Beatenbach." With this

[1] Studer, *Das Panorama von Bern* (1850), p. 69, quoting from Perty, *Der jetzige Spiritualismus*, p. 32; cf. the additional examples on pp. 32, 33 of the latter work.

description may be compared the following communication: "On a cold winter's day in 1748, a noise was heard at Solothurn like a distant cannonading in the air, and a few minutes later the strains of a full Turkish band, so that all the inhabitants rushed out of doors. Drums and fifes could be quite clearly distinguished. Some listeners even stated that they distinctly heard the second parts of the wind instruments."[1]

But though some "popular" hallucinations may be partially explained, as in the above instances, by unwonted natural phenomena, in many cases the chief factor must be sought in the emotional excitement, and, generally, in the mental predisposition of the percipients. The following is an example:—[2]

All the crew of a vessel were frightened by the ghost of the cook, who had died some days previously. He was distinctly seen by all, walking on the water with a peculiar limp which had characterised him, one of his legs being shorter than the other. The cook, who had been recognised by so many, turned out to be a piece of wreck, rocked up and down by the waves.

In the same way, the whole of the thirty-two men forming the crew of the castaway yacht, "Ter Schelling," saw fishermen at work, whom they took for Dutchmen, on a desolate and in reality quite uninhabited coast. So great was the contagious force of this hallucination, that not only the sailors, but the

[1] Perty, *Die mystischen Erscheinungen der menschl. Natur* (2nd ed.), i. p. 133. The majority of the above instances are taken from this author.

[2] Hibbert, *Sketches of the Philosophy of Apparitions* (Edinburgh, 1825).

captain, mate, and surgeon saw it even when making use of the telescope.

To this category belong also the many religious "epidemic" hallucinations, which occur with especial frequency at times when a religious community is being formed, or during any period of religious excitement. An example may here be briefly given.[1]

Near Mettenbuch, a small hamlet on the edge of the Bavarian forest, not far from Deggendorf, lights had been seen by various children from the middle of September 1877 onwards, hovering about a damp spot in a ravine, where a blackberry bramble was growing over the stump of a tree. These were set down as "lights of the souls in purgatory" ("Armen-Seelen-Lichter"), and prayers for the dead were offered up on the spot. To prevent disorder, these meetings were prohibited by the police. Nevertheless, some of the neighbours still went with their children to pray near the spot. This was the case at 7 P.M. on December 1st. "Now the little light floated down towards the ditch, remained stationary, and then went out quickly. Suddenly a girl (aged 10) cried out, 'A bairn! a bairn!' The apparition disappeared, but soon after two girls exclaimed, 'The child Jesus! it is the child Jesus!' They were about to hasten up to it, but the vision vanished—appeared once more, indistinctly, and again disappeared."

[1] I obtained the particulars of this affair from Dr. Lang of Grosshesselohe, Member of the Munich Section of the "Gesellschaft für psychologische Forschung." While expressing my thanks to him, I may add that he states that the father of the two girls who first saw the vision was in a lunatic asylum, while their mother had a tendency to hysteria. The apparition might in any case have been encouraged by the excitement of the "Culturkampf," by the similar visions at Marpingen, by the special efforts made by the local priest at that time to extend the worship of the Virgin, and the great influence of the Benedictine monks who distributed pamphlets on the Marpingen visions, as well as by theatrical performances of legends of the Virgin and Advent mysteries. The passages of the text between inverted commas are quoted from the Rev. Father Benedictus Braumüller's *Kurzer Bericht über die Erscheinungen unserer lieben Frau bei Mettenbuch.*

This vision, the details of which soon became firmly fixed in the children's minds by questions and conversation, appeared still more distinctly on the following day, as soon as the children caught sight of the *point de repère*, the stump. This time the child seemed as though about to approach them; and, soon after, amid the prayers of those present, the principal persons and scenes comprised in the children's religious knowledge made their appearance—the Virgin, the Crucified, Saints, etc. Five children in all shared in these visions, which lasted till December 21st. Conversation with the visionary figures took place. "If the children asked the Virgin anything, it was not necessary to address the question aloud to the vision; it was enough to think of it clearly in their own minds. They received the answer from a sweet voice, which was not like the voice of any human being. And if they asked in this way, quite separately from each other, they all received the same answer." (We are informed that they asked at the instigation of their parents, so that the questions were probably fixed beforehand; that the answers should be identical is only natural.)

These epidemic hallucinations unquestionably do not owe their origin to telepathy, but other "collective" hallucinations affecting a small number of people (two or three) are often thus explained.[1] Simpler occurrences of this kind—*e.g.*, the hearing of a crash, or the like—naturally give rise to the supposition that it is a case of real, external noises. But, on the other hand, many highly complex collective hallucinations are reported which such an explanation seems insufficient to cover. The following case may, perhaps, contain the key to one class of these:—

Two sisters were seated in different rooms; neither could see the other, but both could overlook from their places different parts of the hall. Both heard at the same time an (objective?) noise, which both attributed to the opening of the front door,

[1] Collective hallucinations of this kind are very frequently reported, cf., *e.g.*, Appendix I.

as it was the hour at which their father was in the habit of returning from his daily walk. The one saw her father cross the hall after entering, the other saw the dog (the usual companion of his walks) run past her door. It afterwards turned out that their father had not been out at all on that day, but had remained all the time in the dining-room with the dog.[1]

This case, which—in consequence of the two hallucinations being different—lacks the marvellous and exciting elements found in many other narratives, shows, precisely through this difference, that one and the same *point de repère* (perhaps sense of time and objective irritation of the sense of hearing) acted by way of suggestion on both the sisters. The two hallucinations, however, differ from each other in virtue of the difference of the connected associations. Had the association of ideas been the same, the form of the hallucination would have been identical; the process would then have been much less intelligible to the observer, and the suggesting cause as difficult to discover as in the majority of collective cases. At any rate, to suppose a similar connection of ideas in both minds appears to me to be the simplest way of explaining many of these cases.

I have already (p. 94) pointed out[2] another kind of simultaneous and identical, or at least similar hallucinations, produced by suggestive questions,

[1] Cf. *supra*, p. 190.

[2] In the Report, however, p. 325, a plea is entered for telepathy: "On the whole, we are inclined to think that in collective cases there is generally a combination of telepathy with suggestion by word or gesture, each helping the other; and that this is the reason why the proportion of collective cases out of those in which a second possible percipient was present is large as compared with the proportion of successful cases of telepathy among those in which we must suppose that persons dying, or in some other crisis, have desired to communicate with their friends."

exclamations, gestures, and the like. The ease with which, as we have seen, such appearances adapt themselves in recollection makes it easy to understand how it is that in such cases, as a rule, several percipients should assert themselves to have had *exactly the same* perception, agreeing even as to the details of dress. Podmore, in one of his articles, compares the result of the mental process by which the several hallucinations are moulded into uniformity to a composite photograph.

The process of adaptation is most clearly shown when special circumstances cause the accounts of the various percipients to differ instead of agreeing with each other. This is illustrated in the following case, which, moreover, shows how easily the recollection of a hallucination may be modified by the simplest suggestion shortly after its occurrence, and therefore before the memory-image has become fixed through repeated narration. Two girls stated that they had met a gentleman in the street and distinctly recognised him. This gentleman was afterwards discovered to have died in his own house at that very hour. Being asked if they did not think him looking ill when they saw him, one girl adhered to the statement that he looked much as usual, while the other—under the overpowering influence of the coincidence (now suggested to her mind) between the apparition and the death—gave the information that the gentleman looked strangely pale. She had previously said nothing of this remarkable paleness, simply because this was an additional element added to the memory-image by the suggestive question.

We must not, therefore, unhesitatingly cite the comparative frequency of these cases in proof of

telepathy, as though no other explanation of them were possible.[1] That it should be just collective hallucinations which are so frequently reported as coincidental need not seem strange. If there is an actual occurrence of simultaneous and similar (or identical) hallucinations, such occurrence, owing to its rarity and the degree of interest compelled by it, will naturally tend to connect itself with some other prominent event; and, conversely, the occurrence of such an event as the death or mortal danger of a friend is most calculated to produce memory-delusions of this kind.

Alleged Characteristic Peculiarities of Telepathic Hallucinations.—I cannot attribute a greater degree of importance to the attempt to discover in "telepathic" hallucinations certain characteristics which testify to their peculiar origin, and to separate them, in degree as well as in kind, from "subjective" or "falsidical" ones. The higher degree of distinctness attributed to them arises, first, from the fact that, as a rule, the necessity for establishing a connection only occurs when a strong impression has been produced; while the less impressive, paler sensory delusions fade sooner, disappear from the memory, and can no longer be recalled when needed. In the second place, the actual or supposed coincidence is sufficient to impart more relief and vividness, even to less fully externalised hallucinations. A second peculiarity ascribed to telepathic hallucinations, the feeling of anxiety and uneasiness which accompanies them, acquires a special significance when we remember that, precisely in delusions of memory, a feeling of tension and dis-

[1] Still more does it seem premature to indulge in hypotheses concerning the mechanism of telepathic action on several persons. Cf. *Phantasms of the Living*, ii. pp. 277 *et seq.*

comfort which may well influence their details, is apt to prevail.

Experimentally produced Telepathic Hallucinations.—Although none of the circumstances hitherto discussed seem to me to afford any ground for assuming telepathic influence, manifesting itself in the content of hallucinations, the experimental evidence appears to be somewhat more favourable. However, even here the results are not free from ambiguity. The numbers—far transcending all probability—of successful experiments on some persons are to be matched, on the other hand, by experiments on other persons (especially with the exclusion of all contact) in which non-success—equally transcending probability—is to be recorded. One might perhaps be as much justified in deducing from the latter series of experiments a general law that all attempts at thought-transference act unfavourably on guessing, as in inferring the influence of thought-transference from the former series.[1] Moreover, these experiments have most distinctly shown how incalculably difficult it is, in such investigations, to exclude all sources

[1] Generally speaking, the results of those experiments in which the percipients made drawings of the hallucinatory objects, which proved to be similar to those produced simultaneously by the agents, are open to Lehmann's objection that this similarity is based on self-deception, the rough, indistinct scrawls being capable of different interpretations, and their points of resemblance overrated. The instance he gives, however,—that, while he, as percipient, drew a cat, the drawing was found to resemble the candlestick drawn by the agent,—is not very happily chosen. Why did he draw the cat standing on its head, the adherents of telepathy might ask, and why did he cease drawing at the precise point where the resemblance ceased between the object which was in his mind and that thought of by the agent? It might plausibly be urged that he had made the drawing under telepathic influence, but misinterpreted the image transferred to him.

of error—*e.g.*, unconscious suggestion, number-habit, identity of associations, etc.

To one of these sources of error, lately discovered and known as "involuntary whispering," I wish to call special attention here. I shall therefore proceed to describe a recent series of experiments bearing on this point.[1]

The experimenters, F. C. Hansen and Alfred Lehmann, started from the view that, if thought-transference actually exists, it must be brought about by some known or unknown form of energy (*e.g.*, by undulatory movement of some medium). If this were so, they further concluded, then it must be possible to concentrate this, like every other undulatory movement, at a single point, by means of concave mirrors, and, through this condensation and strengthening to do away with the need for hypnotising of the subject in order to produce hyperæsthesia, and thus render it possible to observe the phenomena in their own persons. If then a sufficient number of cases fulfilling the conditions could be obtained, they would thus be in a position to discover the laws of the phenomena. In accordance with this, they placed two spherical metal mirrors, of about half a metre in diameter, facing each other, some distance apart, and sat down, back to back, each being so placed with regard to his mirror, that the thinking part of the agent and the receptive one of the percipient (*i.e.*, their heads) were at the foci of their respective mirrors. The objects of transference were the numbers from 10 up to 99, which, being written on counters (such as are used in the game of lotto), were taken out of a bag haphazard by the agent.

In the course of these experiments it was soon noticed that there was a strong tendency to innervation of the vocal muscles when a particular number was thought of for a long time. In order, therefore, to convince themselves that the hearing of involuntarily whispered words had no part in the results, the agent placed his mouth and the percipient his ear, each at the focus of his own mirror, and the former allowed free play to the

[1] F. C. Hansen and Alfred Lehmann, "Ueber unwillkürliches Flüstern" (Wundt's *Philosophische Studien*, vol. xi., part 4).

(hitherto restrained) vocal movements, at the same time taking care to keep the mouth closed so that no movements of the lips were visible, and a bystander could not hear any sounds. Without in this place attempting to explain more in detail how, in spite of all this, real whispering might be produced, I pass at once to the results. In the 500 experiments, in the course of which each of the experimenters in turn acted as agent and percipient, the thought-transference, now that the percipient was *consciously listening*, took place from five to ten times faster than before. 33.2 per cent. of the results were quite correct, 41.2 per cent. so far correct that one of the figures was right, and only 25.6 per cent. quite wrong.

An analysis of the failures reveals many points of interest. It seems that every number shows, so to speak, a definite preference for certain special confusions. Thus 9 was usually confused with 3 and 0, 3 with 5 and 6. Under the special arrangement followed in the experiments, these confusions could only arise from auditory errors, and as the (Danish) numerals, when arranged according to resemblance of sound, form quite other groups, it appeared that the whispering, that is to say, the difference between speaking aloud and whispering, must be the cause of the substitution of similar sounds. A closer examination bears out this assumption. It appears that the anterior lingual vowels (Vorderzungenvocale, i, y, e, ø, æ, œ) tend to be transposed through *a* into the posterior (a, å, o, u), and the rounded vowels (u, o, å œ, ø, y) into the unrounded (a, æ, e, i). But the consonants especially are subject to changes of affinity, owing to the fact that, through the firm closing of the lips, the breathing through the nose, etc., those characteristics which are most salient in ordinary speech are suppressed, and other less prominent movements, taking place behind the principal seat of articulation, attain more importance.

The Danish authors then proceed to draw a comparison between the confusions arising from erroneous hearing in their whispering experiments and those of a long series of experiments in thought-transference, published in the *Proceedings of the S.P.R.* (vol. vi., pp. 128 *et seq.*), in order to show that in both the same laws were at work in the erroneous results. The counter-arguments of the English authors in their account of the experiments do not seem to Messrs. Hansen and Lehmann to meet the point. Certainly the fact that the percipients *saw*

the numbers is of no moment, because they were hypnotised, and the numbers were always spoken of in their presence as *seen*, so that the suggestion was given them that the numbers would appear as visual images. Moreover, the percipient's choice of expressions in some cases indicates that the transference of ideas of number took place through the sense of hearing. Thus in the *Proceedings*[1] we find it noted that "in two or three cases T. said that he saw nothing, but that something seemed *to tell* him that the number was so and so, but 'something' never told him right." The example given happens to be precisely a very characteristic instance of confusion through whispering: the number drawn was 66. "T. said, 'Something says 37,' *sixty* being heard as *thirty*, and *six* as *seven*."[2]

If such sources of error are so difficult to exclude even in these carefully devised experiments, how much greater must their influence be in spontaneous hallucinations. To my mind the chief value of these experiments is to warn us against regarding the spontaneous cases otherwise than with distrust, and if they add to our caution in this respect I do not think we should regard all the trouble which has been expended upon them as lost labour, although in face of the evidence which they offer for telepathy, we are still forced to say "*Non liquet.*"

[1] Vol. vi. p. 158.

[2] At the third International Congress of Psychology, Professor Sidgwick brought forward a series of objections to Lehmann's conclusions, and though I do not agree with him on every point, he seems to me perfectly justified in his contention that the Danish authors have not succeeded in showing how "involuntary whispering" could have operated under the peculiar conditions present in the series of experiments recorded in the *Proceedings* (vol. vi. pp. 128-170). However, whether or not in these special cases unconscious whispering was present is a matter of minor importance here, since I only wish to indicate that, generally speaking, it is a source of error to be reckoned with. Professor Sommer (Giessen) on the same occasion delivered his lecture on "A Graphic Method of Thought-Reading," dealing with another way of explaining telepathic phenomena.

CHAPTER X.

SUMMARY AND CONCLUSION.

Recapitulation of Argument—All Hallucinations conditioned by Dissociation—Objection to Physiological Explanations from standpoint of Psychology—Criticism of Psychological Position—The Physiological Scheme provisional—Bearings of this Study on Theories of Perception generally.

IT would be well now to review the course of our inquiry and summarise its results. It was shown first that hallucinations and illusions, considered as psychical phenomena, are just as much sensory perceptions as the so-called "objective" perceptions; that the nature of the experience is intrinsically the same, and that a distinction can be drawn only by the observer—that is, only on extraneous grounds. As a consequence of this view it was found necessary to include in our definition all false sensory perceptions from whatever cause arising. We thus escaped the fundamental error of separating the hallucinations of disease from the analogous phenomena of sleep and normal life—a course very generally pursued in the past, which has caused hallucinations and illusions to be regarded as something enigmatical and out of the ordinary course of nature.

Still it was necessary, from another point of view, to inquire into the origin of sensory deceptions and

their connection with the states with which they are found most frequently associated. For the data furnished by observation permit of our drawing certain conclusions as to the underlying psychical state, and as to the circumstances in which false perception occurs, and point to its being a phenomenon dependent on disturbed association. The results of the "Census of Waking Hallucinations" point in the same direction, and in many of the narratives quoted in the "Report on the Census" we were able to observe symptoms which justified the conclusion that dissociation was present even in cases where the percipient believed himself to be fully awake.

Further, it was shown that if hallucinations occur in states of apparently accelerated association, as in mania, the excited period of circular insanity, etc., this arises from a misunderstanding of these states, which are really states of disturbed, and thus of partially impeded association.[1] Again, their occurrence during periods of apparently full consciousness is not inconsistent with this view, if we assume in such cases not that a general disintegration of the cortical complexes takes place, but merely that certain element-groups are split off. Such partial dissociation may indeed be observed in other morbid phenomena, which can only be classed as sense-deceptions by straining the term—for instance, in the case of voices heard by the patient which really depend on automatic articulation.

[1] While Krafft-Ebing and Ziehen disagree with this view of Kraepelin's stated above, the facts brought forward by Aschaffenburg in his paper, "Ueber psychologische Versuche an Geisteskranken," read before the third Congress of Experimental Psychology, only serve to confirm it. The experiments of Dr. Forel (Jena) also tend to confirm this view.

That is to say, we are dealing here with a state of systematic dissociation, a state in which indeed, generally speaking, the consciousness is normal, but where the association-paths of a more or less complicated system of elements are wholly or partially blocked.

Oscar Vogt supports this view, since he sees in cases of waking with a systematic partial sleep an analogy to post-hypnotic hallucinations and hallucinations of memory.[1] In his opinion, in which Professor Forel of Zurich concurs, this state may be confined within such narrow limits that the judgment of the persons affected remains perfectly clear, so clear, in fact, that we may trust them to make psychological self-observations and to record them as accurately as if they had been fully awake. (Cf., in the Report of the third International Congress, the

[1] Oscar Vogt, "Zur Kenntniss d. Wesens u. der psychologischen Bedeut. d. Hypnotismus," *Zeitschr. f. Hypnotismus*, etc., iv. 1 (1896). "The act of waking out of certain dream-states produces, under certain circumstances, a peculiar form of partial waking; for certain dream-images are transferred to the waking consciousness. This might be described as an awakening with *a systematic partial sleep*. Each of us can observe faint indications of such states in his own person; the dream-content often seems real at the first moment of waking, pain felt in a dream has been known to persist into the waking state. In general, however, the re-awakening critical faculty soon banishes our credulity with regard to the dream-image. But there are exceptions. Thus a lady of my acquaintance dreamed she saw her own funeral, or rather, she dreamed she had a vision of her own funeral as a premonition that her death was near. During the course of the dream she awoke, but the hallucination persisted, and she recognised the various individuals in the funeral procession. While so doing she was sitting up in bed, and she remained awake after the desistance of the vision. Spinoza . . . relates that he awoke one morning from a profound dream and saw its phantoms so vividly before him that he tried to grasp them with his hands as though they were real, tangible objects. . . . He endeavoured to escape from this state by reading, but found it ex-

paper by Vogt on "Hypnotismus als psychologische Experimental-methode," and the discussion which followed.)

The several kinds of dissociation might be distinguished, by generalising Vogt's terminology,[1] into *total* and *partial*, the latter being subdivided into—

(*a*) Systematic partial dissociation, where a single ideational complex is involved.
(*b*) Localised partial dissociation, where a single cortical centre is affected.
(*c*) Diffused partial dissociation, where the partial dissociation extends over a wide area.

The view which we have arrived at, that false perception is perception in the state of dissociation, renders it unnecessary for us to concern ourselves further with the vexed question whether or not all sensory deceptions are pathological phenomena, and if some are not so to be considered, how

tremely difficult, and it was only after a considerable time had elapsed that the phantoms finally faded away. . . . I once observed a similar state in myself: I was sleeping in a hotel, the window curtains were closely drawn, and the lights were extinguished. In the middle of the night I awoke, my heart beating violently, under the impression that a man had entered the room by the door and was approaching my bed. In the dream I saw none of the objects in the room, but on opening my eyes I saw that the room was lighted up, and I noticed the furniture, —it was just such furniture as one would expect in such a place. Then I was struck by the brightness of the room, and it occurred to me that it might be a hallucination. Gradually the objects in the room became more and more indistinct, till at length they disappeared, and absolute darkness returned. Next morning I saw that the shape and arrangement of the room were quite different, nor do I ever remember to have seen a room arranged in quite the same way as the room of my waking vision."

[1] Vogt, *op. cit.*

the non-morbid may be distinguished from the morbid.[1]

Most of the older writers, indeed, were concerned to show that sensory deceptions, though generally of a pathological nature, were not to be regarded as abnormal or morbid in the case of saints, prophets, philosophers, and other great men. Our answer to this question is simply that *fallacious perception has nothing morbid in itself*, because the state which occasions it is not a morbid one. Nevertheless, the underlying cause which induces this psychological state may be, and frequently is, pathological. Hence diseases are frequently accompanied by numerous and varied hallucinations, which may therefore serve under certain conditions as indications of pathological disturbance, but in each individual case it is not the sense-deceptions themselves which prove the pathological condition, but the accompanying circumstances.

Of course no other answer to the question is possible, since, as we have already shown, all false perceptions can be classed under one type—the type, that is, to which the name "illusion" was formerly given, and which in common usage is still so called. We found that the old distinction between hallucina-

[1] Brierre de Boismont, *op. cit.*, insists with special emphasis on the existence of "hallucinations compatibles avec la raison." Michéa follows suit in *Du délire des sensations*, cap. 9, and *Du délire perceptif compatible avec l'intégrité de la raison*, p. 216; see also Szafkowski, *op. cit.*, pp. 58 *et seq.*; and Falret, "Cours clinique," etc., *Gaz. des hôp.* (5th Sept., 1850); Laehr, *Uber Irresein u. Irrenanstalten* (1852) (who seems to consider the percipient's recognition of the deception as the best test); Griesinger, *op. cit.*; Hagen, *Die Sinnestäusch.*, etc., pp. 271 *et seq.*; Krafft-Ebing, *Die Sinnesdelirien*, as well as nearly all the more recent authors.

tion and illusion referred not so much to the origin of the particular sensory deceptions, as to the possibility of discovering in their content the action of an objective sensory stimulus, or, in other words, it referred to the greater or less resemblance of the false perception to the content of an "objective" perception. By bringing into prominence the general similarity of the process in all sense-deception, whether in the case of complex visions or of mere lapses of perception resulting from failure of attention, we avoided the danger of classifying the phenomena according to their more or less striking character.

Further, in dealing with "negative hallucinations," another class of phenomena usually distinguished from true hallucinations by reason of their content, it was shown that such a distinction was equally beside the mark; that though a great number of the facts grouped under this head must certainly be regarded as phenomena of deprivation (*Ausfall-Erscheinungen*) —*i.e.*, as illusions,—many others hitherto classed with them are true hallucinations in every sense of the term—*i.e.*, are conditioned by forced association.[1]

Thus while the old terms "hallucination" and "illusion," which usage has made familiar, are still retained here, they have been employed in a new

[1] In the latest edition of his *Hypnotism*, Moll still maintains his theory of "inattentiveness." What plausible explanation can he offer in cases like the following: Suppose the hypnotist says to his subject, "Take a good look at this hat; it is becoming gradually smaller; it is shrinking up. See how small it appears, how microscopic! You can hardly see it at all now; it is vanishing; it has vanished altogether!" In such a case, how is it conceivable that the hypnotised subject, after sensibly perceiving the hat gradually becoming smaller and smaller while the hypnotist was speaking, should, on hearing the last words, instead of realising the image of a microscopic hat shrinking into nothing, *suddenly become inattentive?*

sense, and made to refer to the psychological character of the phenomena. Hitherto a difference of origin had invariably been implied in the distinction; here no such difference of origin is implied, nor even one of quality, but merely a difference of systematic order. Besides this psychological definition, I have attempted to give, in terms of physiology, an account of how false perceptions arise, to indicate their occurrence as a link in a chain of successive processes.

It seems necessary here to meet an objection which is constantly urged against such attempts to explain psychological facts by means of physiological schemes. Neither the physical stimuli, it is urged, nor the processes in the nervous receiving-apparatus, whether in the conducting nerves or in the cortical centres themselves—in a word, none of the processes with which physiology concerns itself—are conscious, hence the psychic phenomena being in their nature different from these processes can never be explained by them.

This criticism is best met by a counter-criticism of the method which our critics employ in preference to the physiological method which they condemn. They would place the constituent parts of consciousness in elements, described as simple sensations, ideas, feelings, impulses, etc., whose "fusing," or "blending," or close interaction they suppose to be capable of evoking all states of consciousness. When it is maintained that such a method of accounting for the facts is more reasonable and more guarded than an explanation which depends on hypothetical processes of a physiological nature, it is indeed time to protest; for these simple sensations, ideas, etc., are far less facts of experience than are the "hypothetical" brain and nerve

processes. Strictly speaking, the difference is not one of degree at all, for while the existence of such physiological processes can at least be indicated (though there are confused and opposing views as to their exact nature and action), experience leaves us absolutely in the dark as to the existence of these psychical elements and processes. Our consciousness is entirely unacquainted with any experience which we could describe as "the sensation blue," pure and simple; a *sensation* "blue," that is to say, without some sort of localisation, of form and extension, without feelings or emotions more or less distinct, and divorced from the consciousness of its difference from the sensation which immediately preceded it (yellow, for instance), and so on.

Or to cite another example, we know no emotion without sensational or ideational content, no desire which is not desire of something, no hope which is not hope of something, no satisfaction which is not satisfaction because of something.

What we know by experience are *things*, blue things, similar things, things expected, hoped for, or feared (of course the given "thing" may be purely imaginary); of "psychic elements" arrived at by reflection and abstraction, on the contrary, we find, among these "things" existent in the mind, no trace. This point being conceded,—and it seems hardly necessary to labour it further, since it cannot seriously be called in question,—our position is considerably advanced.

It is true the objection may be urged that the case of the psychic "atoms" is no worse than that of the material ones. These, too, are known first through their action, and are not a part of immediate ex-

perience, and yet (for we need not here concern ourselves with the anti-atomistic theory) the whole material world is built up of them. Why, then, should we not be able just as well to build up the world of consciousness with the psychic atoms, though these are inaccessible to experience?

Nevertheless, such an objection ignores the main point, ignores the claim implied in the analogy, namely, that the elements must be of like nature with their effects. If a psychic fact is a mere cluster of elements, whence should it derive its nature if not from the nature of the elements themselves? The atoms of which the *material* world is built up are *material*. Their existence does not consist in their being primarily objects of consciousness. It is not a contradiction of their nature that they should remain alien to immediate experience. But the case of the psychic atoms is very different.

For the nature of all psychic facts, all experiences, all "things," consists, as I have already indicated, just in their "Bewusstheit," in their being immediately known, felt, experienced. Or, if I may use an expression which excludes the otherwise unavoidable question "known by whom?" their nature consists in their *being there*.[1] Thus, if there are really psychic elements from whose "flocking together" the things immediately perceived are built up, these elements must be data of the immediate consciousness too. Nevertheless, as we have just seen, it is precisely this quality of being mentally present which is lacking to these elements with which psychology occupies itself so much, with

[1] Of course, it is not possible to criticise here the other views as to the nature of psychic facts, and to discuss the arguments urged against the view adopted above.

which it not only seeks to describe, but to build up states of consciousness. They cannot, therefore, be regarded as elements of known mental "things."

If they are not that, what are they then? I will state my view shortly: they are the elements out of which not the psychic fact itself, but a symbol for it, its *description*, is built up.

For, while of course there is nothing to prevent us from giving a name to each and every state of consciousness, labelling it in fact, it is obviously impossible, through words or any other medium, to make any one else share our psychic experience in all its fulness and intimacy, to make it the same experience for him. For if we wish to communicate some specific experience to another, how should we set about it? Take an illustration. Suppose I want to let a friend hear the *timbre* of the note *a* on a particular piano, but, unfortunately, just before he comes, the string snaps. What shall I do? Perhaps I might strike the note *g* and say, "*a* is not like that, but a little different." Then perhaps I might strike *b* and say again, "*a* is not like that either, but different." Then I might possibly let him hear the intervals *c-d*, *d-e*, *f-g*, and then sound *g*, so that he might be able to construct the interval *g-a* in his mind. But all the time I should be trying to communicate the incommunicable; I should never make my friend share my original experience by this means, for the consciousness of the interval in each of the supposed cases is a quite specific one, different from the others, and none of these is identical with that particular fact of experience which we call the *g-a* interval, still less with that experience which we had when the note *a* was struck.

But what is the method which I actually employ in such a case, the method which we are always employing?

It may be roughly formulated as follows: the description of a state of consciousness consists in the production of other specific states of consciousness quite different from the first. But that is not a full account of the method. I do not call up experiences of any and every kind in order to describe the specific *timbre* of the note *a*. I do not pinch my friend's arm, show him a match-box, or give him a lump of sugar to suck. Nor do I sound random notes and intervals on the piano. I select certain notes, certain differences—and for a very simple reason. For, while the psychosis produced in my friend was, say, *g* and *b*, what I experienced was something quite different, something which was neither *g* nor *b*, but which might be described as the "*g-a* similarity," or as the "*b-a* similarity."

Moreover, in describing my experience to my friend, I evoked in him not one experience but many. If I tried to describe a state of consciousness merely by showing a plum, nothing would be gained. If I wished to describe a bright blue sky by producing other impressions, I should have to show my friend not only a plum, but a blue flower such as succory or flax, point out to him an Uhlan in his blue uniform, bid him look up at the ceiling of the room and then at the bright blue eyes of his child, etc. Whether all this would serve my purpose is a question which need not be answered here. But what do I experience during this description? I experience the sky-plum similarity, the sky-uniform similarity, the sky-eye similarity, but I experience something more,

the consciousness, to wit, of a common attribute in a series of similars, and this mental state is labelled in our speech with certain specific terms. For instance, the feeling of similarity which runs through the series of similars "sky-eye," "sky-plum," "sky-uniform," we call *blue*, that in the series "sky-upward glance," "sky-ceiling of the room," we call *high*, or *above us*.

What is it I do then when I describe an experience as blue, calm, and above us? I mention a number of states which succeeded each other in me, and which we may therefore describe as "a series of resemblance-experiences." But these namings correspond, to return to the old illustration, to my experience when the notes *g* and *b* were struck. In my former experience *a*, which I tried to describe by *g* and *b*, I was conscious of *a* only, and not of the *g-a* similarity nor of the *b-a* similarity, which are neither identical with *a* nor parts of it. And just as certainly as the experience *a* did not arise from the combination of the *b-a* similarity and the *g-a* similarity, so does the idea "sky" not arise out of a combination of the ideas "blue," "above us," etc.

This is but a crude comparison, but perhaps illustrates my meaning better than a long explanation. A psychology which regards the elements of the description, the symbol of the experience, as elements of the thing itself, proceeds as though one should maintain that the sound *i* could be built up of the elements of its symbol, the letter *i*—that is to say, out of a short upright line and a dot.

From what has been said it follows that we can use the expressions which describe the qualities of the different psychic facts only while we are regarding them with reference to their likeness to or differ-

ence from others which resemble them—that is to say, only in so far as we are dealing with their morphology, or are employed in building up systems according to definite principles, and classifying the specific states as plants are classified in the Linnæan system.

But these elements of qualitative description are no longer applicable when we cease to deal with the phenomena of consciousness as series of similars and proceed to study them with reference to causality.

By this expression I do not mean to indicate the view which regards the phenomena of consciousness as symbols of a world existing independently of us, of which they are the reflections in our subjectivity. Such a view has nothing to do with experience, and is of course purely speculative. By a causal view of mental phenomena I mean the view which arranges "thoughts or feelings" (*i.e.*, mental states) in a sequence, following in time; which seeks to express in a simple formula our experience of the successive character of individual "states of feeling," and our expectation that after a particular succession of "feelings" a certain other "feeling" will follow.

Certainly no one will deny that for one class of psychic phenomena, for sensory perceptions, the formulæ to which we have reduced our expectation of their successive occurrence are the formulæ of mechanics which underlie the physical, chemical, and physiological explanation of an experience. And if this is granted there is nothing in the nature of the case which prevents us from applying the same method of explanation to any other groups of mental phenomena (ideas, feelings, etc.). The principal argument urged against such a proceeding rests, as

we have already seen, on the fact that the physiological processes adduced in explanation are not "psychic facts," and that therefore we cannot explain by them facts which differ from them in kind; but this objection is based on a confusion of the *world of matter*, that is to say, of the formula by which we express our expectation of seeing certain states of feeling follow each other in time, with the *world of "things in themselves."* The other objection, that our knowledge of brain-processes is far too limited for us to be able to explain psychic facts by them, has nothing to do with the principle involved. It may be met by pointing out that there is a whole group of such facts, to wit, sense-perceptions, for which no psychological explanation can be found, and that any physiological explanation is only meant as a formula, to be amended by each new experience, as a *scheme* to which we reduce our past experiences.[1]

Nor did my explanation pretend to be anything more than such a scheme, into which all our former experience relating to false perceptions may be made to fit. But such a scheme only appeared practicable if we distinguished more sharply than had been done heretofore three aspects of the phenomenon: (1) its *sensory* character; (2) the *falsity* of the perception; (3) the *content* of the hallucination.

[1] The question, so hotly discussed at the Third International Congress of Psychology (see pp. 68-73 of the Congress Report), as to whether and how far psychic facts admit of a physiological explanation may accordingly be answered as follows: Psychology, and psychology only, furnishes the facts to be explained, since it sifts, by careful analysis, the material from the surrounding dross; but, on the other hand, the causal explanation of the phenomena necessarily devolves upon physiology, or, to use the wider term, upon Natural Science.

It seemed simplest to refer the sensory character to the same cause which is assumed in all other sensory states of consciousness; the falsity of the perception we traced to the circumstance that in any percept the corresponding brain-process does not depend upon the incoming stimuli alone, but also upon the state of the reacting brain; and the specific character, the "content," of each individual false percept we referred to the elements to whose activity were due the special tension-relations in the brain state. Or, to express it otherwise, we found that a false perception occurs when for some reason or other (Chap. VI.) the cerebral elements are in such a state of tension that the incoming stimuli (Chap. V.) stream towards element-groups which normally would be discharged only by stimuli of another kind (Chap. VII.).

Passing over the subject of the characteristics of hallucinations considered in Chapter VIII., and the question thereafter discussed, whether the content of certain sensory deceptions is "telepathically" caused,[1] I will in conclusion briefly advert to the important part played by the study of hallucinations in other inquiries. It would lead us too far to discuss here its bearing on *Erkenntnisstheorie* and metaphysics, but I should like to indicate the importance of our present inquiry in relation to the very complex processes and the many factors associated in the production of sensory perception.

In the following discussion we shall be dealing, it is true, with certain anomalies of perception which

[1] As the proofs of this chapter are being corrected I received Morselli's work, *I Fenomeni telepatici e le allucinazioni veridiche*, and feel bound to call the reader's attention to the arguments against telepathy on pp. 15 *et seq.*, an excellent piece of methodical criticism.

were excluded by the definition at the beginning of the book—that is to say, with perceptions common to all persons alike, though they demonstrably do not correspond to the objective facts. Of course such percepts are just as much "false" as the idiosyncratic ones to which, for the sake of simplicity, our inquiry has hitherto been confined, and it seems to me an important argument in favour of the theory of false perception here advanced that these universal fallacies fall quite naturally into the scheme suggested for the individual ones.

For in these universal fallacies also the stimulus must be supposed to reach and discharge groups of cortical elements, whose activity is normally only associated with a stimulus then lacking, whilst other element-groups usually aroused by the incoming stimulus are excluded from the process, or participate in it but slightly, because the main stimulus-wave is diverted into another path.

But whilst in sensory deceptions which occur individually and sporadically the factor which leads to the diversion of the stimulus-wave from its normal path —what we have called "enforced association"—is an occasional one, in the case of universal fallacies of perception the cause must, of course, be constant and universal. Hence we must assume that the enforced association does not, as in individual sense-deceptions, depend upon the momentary cerebrostatic condition, but that it is brought about because the elements in question have been frequently and strongly excited simultaneously with the elements now stimulated, so that habit has deepened the interconnecting channels and the resistance in them is feeble—that is, they are always wide open. For it is

only on some such assumption, only by referring the enforced association to the organisation of the nervous apparatus built up through regularly recurring physiological activity, that we can satisfactorily explain these universal fallacies of perception.

But if this is the case we shall find this class of deceptive phenomena of special value in elucidating the organisation of the nervous apparatus and its functioning. For if certain element-groups are found to participate in false perceptions of this class we must, according to our theory, infer their co-operation in similar normal "objective" perception, since it is only to this constant and habitual co-operation that they can owe their participation in the stimulus-wave in false perception.

As an illustration of how false perceptions may be used in such a way I will refer shortly to a cognate inquiry,[1] although indeed the deceptive phenomena with which it deals are not, strictly speaking, hallucinations and illusions. They serve, however, to illustrate the fact frequently referred to in the course of our inquiry, that the explosion of brain-elements from which wide-open paths of association lead to other elements produce in the consciousness only states of feeble intensity and *vice versâ*.

Seashore starts from the known fact[2] that an object when supposed to be lighter than it really is, feels when lifted heavier than the reality, and one of which the weight has been over-estimated beforehand feels lighter than it actually is. He had

[1] Seashore, "Measurements of Illusions and Hallucinations in Normal Life," *Studies Yale Psych. Lab.*, 1895 (iii.), pp. 1-67.

[2] He cites, *loc. cit.*, Gilbert, "Researches on the Mental and Phys. Development of School Children," *Studies Yale Psych. Lab.*, 1894, ii. 43-45, 59-63; Dresslar, "Stud. in the Psychol. of Touch," *Amer.*

two sets of cylindrical blocks made, each set consisting of 17 pieces. All the 34 cylinders were of the same material, the same height, and painted the same dull black colour. The cylinders of the first series, *A*, were also of uniform weight (80 gramm.), but differed in bulk as their diameter increased, in geometrical ratio, always by 1-10th (from 20-91.9 mm.). The cylinders of the second series, *B*, on the other hand, were all exactly the same size and therefore appeared all exactly the same to the eye. They differed in weight, however, each successive block being 5 gramm. heavier than the preceding one (diameter 42.9 mm.; weight, 40-120 gramm.).

The subjects of the experiment were made acquainted with the peculiarities of series *B*, but left in the dark as to the relative weights of series *A*. They were requested to select for each weight in set *A* a corresponding one in set *B* by taking one at a time from *A* and placing it by the side of successive blocks in *B*, lifting one of these at a time until the one was found which seemed to have the same weight as the block from *A*. The average of twenty-five experiments yielded the following figures :—

A.	B.	C.	D.	M.V.
20	110.2	−22.9	+30.2	7.5
22	103.8	−20.9	+23.8	7.0
24.2	98.2	−18.7	+18.2	5.0
26.6	94.4	−16.3	+14.4	6.5
29.3	94.0	−13.6	+14.0	6.5
32.2	89.2	−10.7	+ 9.2	8.0
35.4	86.3	− 7.5	+ 6.3	5.0
39.0	85.4	− 3.9	+ 5.4	4.0
42.9	83.8	0	+ 3.8	6.0
47.2	80.4	+ 4.3	+ 0.4	5.0
51.9	75.6	+ 9.0	− 4.4	4.0
57.1	71.6	+14.2	− 8.4	5.5
62.8	69.0	+19.9	−11.0	6.5

Psych. Journ., 1894, vi. 313; Charpentier, "Analyse d. quelq. élém. de l. sensation d. poids," *Archives de Physiol.*, 1891 (5), iii. 126; Müller and Schuhmann, "Über d. psychol. Grundl. d. Vergl. gehobener Gewichte," *Arch. d. ges. Physiol.* (Pflüger), 1889, xlv. 37; Griffing, "On the Sensations of Pressure and Impact," *Psychol. Rev.*, 1895, ii., Suppl. i.; Flournoy, "De l'influence de la perception visuelle des corps sur leur poids apparent," *L'année Psychol.*, 1894, i. 198.

A.	B.	C.	D.	M.V.
69.1	65.8	+26.2	−14.2	6.5
76.0	64.2	+33.1	−15.8	6.5
83.6	61.2	+40.7	−18.8	6.0
91.9	58.6	+49.0	−21.4	6.5

A = diameter of the block in set A (having weight of 80 gr.).

B = weight of the block in set B (having a diameter of 42.9 mm.), chosen as equal in weight to the block of set A.

C = number of millimet. by which the diameter in set A differed from that in set B.

D = grammes by which the estimated weight of the block in set A differed from its true weight.

M. V. = mean variation; to obtain the mean variation of the series, each result is to be divided by five.

From these results may be deduced a law holding good within a limited range with regard to the influence of visual perceptions of size upon our perceptions of weight—viz., that objects of similar material and of the same weight which differ in size are when lifted felt to be of different weight, the smaller being over-estimated and the larger under-estimated. The intensity of the false perceptions varies directly with the perceived amount of difference in size between the bodies compared —that is to say (according to Weber's law), increases in arithmetical progression, while the objective difference in size rises in geometrical ratio.

Further series of experiments, the discussion of which in detail would lead us too far, show that even in frequently repeated trials the deceptions remain fixed, and even persist, though certainly in a somewhat lesser degree, when the actual relations of weight and the nature of the illusion are known to the subjects.

Seashore accounts for these hallucinations of weight by the fact that one of the factors which co-operates in perceptions of weight stands out in an unnatural relation. In the foregoing cases we have to do with the perception of size, which plays a part in the preliminary estimate of the weight—that is to say in the accommodation of the muscular lifting-apparatus, since the bulk decides for us the difference of weight between two bodies which otherwise look the same, and therefore seem to be made of the same material. If our estimate of

the weight of a body $= w$ is not correct, and if to lift it we find a greater effort $w+d$ necessary, then this addition of d to w, since it occurs in an unusual relation, is over-valued. We perceive with abnormal intensity the force actually spent, $w+d$, and the weight of the body which had been under-estimated is over-valued. If, on the other hand, we have over-estimated the weight, and if the actual output of force is $w-d$, then d is over-valued, and the residuum $w-d$ under-valued, that is to say the body which was judged to be heavier feels lighter than it actually is. This effect is so apparent in the experiments cited above that the smallest body of the series A, with a diameter of 20 millimetres, was felt to weigh about double as much as the largest block of 91.9 mm. diameter, which actually weighed the same.

The persistence of the deception in cases where the subjects had been told all the conditions of the experiments is due to the fact that a definite kind of association had become an organic habit, which the newly acquired knowledge was powerless to counteract. "Size has ever before been influential in determining weight, therefore relatively it cannot be suppressed. This is not a sign of weakness in discrimination or judgment, it is the working principle of those whom we consider most intelligent. That feeling of interest which sight commands is persistent . . . and in the ordinary flow of conscious activity it is almost impossible to muster force to dam it up."

This example shows clearly how such deceptions may demonstrate the importance in certain perceptions of factors whose influence is usually overlooked.

The method is of course not new. A whole series of psychological experiments is founded upon it. For instance, to note here one other work of the same class, I may mention Lipps' treatise on *Æsthetischen Eindruck und Optische Täuschung*,[1] in which the geometric-optical deceptions (compare, *e.g.*, above p. 5) are referred to the co-operation of ideas

[1] Which appeared in the *Schriften der Gesellschaft für Psychol. Forschung*, vol. 9-10.

of mechanical activity in the perceptions, the importance of these ideas in our perception of form is emphasised, and an æsthetic of spatial forms (especially in architecture and keramic art) based upon it.

I need not, however, dwell further upon the way in which these universal fallacies may be employed to elucidate the normal process of perception; the example which I have given above sufficiently illustrates the principle involved. Of course such a practical application is conceivable only on the view maintained in the present work—the view, that is, which regards false perception as none the less *perception* because modified by the co-operation of unwonted elements, or by the non-co-operation of those which normally share in the process, which regards it as subject to the same laws which govern all other perception, and not as an abnormal phenomenon which sets all law at defiance.

APPENDIX I.

In the following pages, the narratives of waking hallucinations collected under the direction of Baron von Schrenck-Notzing are published for the first time. The cases are so arranged as to correspond exactly with Table II. *c.* (see p. 366). The Roman figure prefixed to each narrative indicates the page of the collection on which each narrator has answered in the affirmative the question whether he has experienced a waking hallucination. The Arabic figure indicates the line on that page on which his name, age, etc., are to be found. The narratives which deal with more than one case are divided, and the individual cases denoted by letters—A, B, C.[1]

In conclusion, a few narratives, received at the same time, dealing with presentiments, prophetic dreams, etc., have been added.

Visual Hallucinations.

V. 18. C. Frau. K.—"In December 1886 I was awakened one night by my children. . . . I attended to them, and lay down again. Suddenly there was a nun standing before my bed—the sewing-teacher in the Deaf and Dumb Institute at Hohenwart, in Upper Bavaria,—just as I had known her in life, quite unchanged, and kindly. She did not speak. I saw the apparition, by the night-light, only for a moment. I was in good health and free from excitement. I remained awake for some hours longer, and reflected as to what this could mean, thinking that perhaps something

[1] The original narratives are preserved in the reports of the (Munich) Psychological Society, where they can be examined on application, if desired.

had happened to her. But these thoughts were occasioned only by the vision. Two days after I heard that the sewing-teacher had died of blood-poisoning (in consequence of an injury to her foot) at the precise hour when I saw the vision. I made special inquiries on this point. I had no knowledge whatever of her illness, but believed her to be quite well. I told this occurrence to several people, my husband among them, before the news reached us." (Herr K. gives verbal confirmation of his wife having spoken to him about the vision, but cannot remember the exact time.)

X. 13. B. El. Pa.—See above, p. 247.

X. 14. B. Martha Bl.—"When my mother was dangerously ill, in July 1887, at Munich (M . . . strasse, 5), I saw her figure at the bedside, undressed, when I was lying awake in bed, looking just as she did in life. A week later the death we were expecting took place. I had previously related this occurrence to my father."

XXIII. A. v. M.—See p. 99.

XXVIII. Louise H., Meiningen.—"In the early days of November 1881 I had gone to bed as usual, one evening, about ten o'clock. My mother, eighty-four years of age, was already asleep in my bedroom; a night-light was burning. I lay down in bed fully awake, and had scarcely been in that position a few seconds, wide awake, and with my eyes open, when I heard a peculiar crackling sound in the sitting-room, and suddenly saw it brightly lit up, although I had myself extinguished the petroleum lamp on going to bed. In the doorway between the two rooms stood my sister Christel, married to the insurance-agent, Br——, at Erfurt, and at that time very ill with cancer in the breast. She had on an indoor dress of printed calico, and came towards my bed, stretching out her hands. In my consternation I called my mother, as loud as I could, but was unable to awaken her, and then the image of my sister disappeared. She died a few days after, or it may have been on the same day. I may mention that, in order to get into the sitting-room, any one would have to pass through the bedroom first. I had known for years that my sister was suffering from cancer, but had not on that day been specially worried or excited."

XXXI. A. Sophie T.—"In December 1867 I saw my

husband (then on his death-bed) come in his dressing-gown, out of the bedroom into the room where I was just preparing him some lemonade and milk. He nodded to me, pointed to a certain spot, and disappeared. I hastened to his bedside with the drink, and found him quietly sleeping. He had not been up at all."

XXXI. B. Sophie T.—"It was at the end of October 1867. Our house adjoined a garden about one and a half acres in extent. Dinner was ready at 1 P.M., when I saw my husband strolling down the garden in the opposite direction to the house I went to the window and took hold of the bolt to open it. I was just going to call to him, when I looked sideways into the room, and saw my husband sitting comfortably in the same room, between the second window and the stove, holding a newspaper in his hand. I called out, 'Oh! you are here?' 'Did you think I was outside? I have not been in the garden,' was his reply. I must also add that our little dog, whom I had seen in the garden trotting along behind my husband, was lying stretched out under his chair, and while we were speaking, slowly got up, stretched himself, and yawned. It would have been impossible for my husband, in the short time that had elapsed between my seeing him in the garden and finding him seated in the room with the newspaper, to have traversed a long piece of the garden path and two large rooms."

XXXI. D. Sophie T.—"At the beginning of August I was visiting some relatives at Berlin. Having to go some distance by tram-car, I saw, for the space of some seconds, my son, who lives at Düsseldorf, sitting beside me. This happened to me twice during the short time I was at Berlin."

XXXVII. Anna Schm.—"Early in the morning, while still in bed, I suddenly saw (I believe I was fully awake) the figure of my mother, who had died two years before. (She often appears to me in dreams and when half asleep, but never so distinctly as on this occasion.) She was holding my child, then still living and in good health, by the hand. On my addressing it, the figure vanished as quickly as it had appeared. I had this hallucination between half-past four and five on the morning of December 2nd, 1889."

XXXIX. A. Josephine Schm.—See p. 101, Note 1.

III. 22. B. Louise Eder.—"Five months after my mother's

death, in 1887, I was lying awake in bed and thinking of our removal from the house, which was to take place shortly. Suddenly I saw my mother standing before the bed, looking exactly as she had done in life, but dressed in a chemise only. She said nothing, and soon disappeared. At first she stood near the head of the bed, then near the foot. I felt my breath oppressed, as in nightmare. I closed my eyes, and only saw her more distinctly. When I opened them she was standing beside me. The room at the same time looked like a large hall."

IV. 18. V. G.—See p. 100.

X. 13. A. Elizabeth Pa.—See p. 247.

XXXI. C. Sophie T.—"My nephew, who died at Berlin in January 1881, appeared to me, here in Düsseldorf, in the Hofgarten. He walked beside me for a few seconds. When I called him by name—'Otto'—the phantom vanished. (One forenoon in the autumn of 1888)."

XXXV. B. Frau M. Cla.—"After the death of a beloved sister, I used to take long walks alone. As I walked along, lost in thought, mostly in broad daylight, it often seemed to me as if she were gliding along beside me, at a distance of about two metres. She looked quite calm, cheerful, and beautiful, but the image was a very unsubstantial one. The only definite thing about it was the expression of the face, and if I ventured to look straight at the apparition the whole thing disappeared."

XXIV. D. Louise Han.—"Seven years ago, in the spring of 1882, I saw a poor man who vanished when I was just about to give him an alms."

XXXV. C. Frau M. Cla.—"When a girl of seventeen, I was on a visit to a friend in a Danish town. There had been a family gathering, and the house was full of visitors, so that for the first few nights I had to share my friend's room. After the guests had left, one of the spare rooms in the side wing of the house was assigned to me. At night I went to bed as usual, but omitted to lock the door. Soon after I had put out the light the door opened, a woman came in with a lighted candle, and kept on looking at me; she came up to the table which stood facing the bed, and over which hung a large mirror. I could see in the mirror the face of the woman, who continued to look fixedly at me; then she turned round and went out of the room without

saying a word. I sat upright in bed. I have seen all the servants in the house, and know that the woman was not one of them. The incident had no after-significance for me."

XXVII. G. W. saw "in a hotel at Wiesbaden an elderly woman dressed like a servant, who gazed fixedly at me, standing at the door just in front of the lock. Though the whole figure, its dress and features, were plainly visible, yet it was completely transparent, so that I could also see the door-handle and the door itself behind it. It was broad daylight, I was sitting up in bed, and am firmly convinced that I was wide awake and in possession of all my faculties. The apparition lasted about half a minute, and then disappeared."

XXXIX. B. Josephine Schm.—See p. 101.

XXIV. C. Louise Han.—"When a child of seven or eight, I once saw a face which looked at me sadly, and at which I gazed full of curiosity. But when I told my mother of it, she tried to convince me that I had been mistaken. Nevertheless, I have been unable to forget it to this day."

XXXV. A. Frau M. Cla. (abridged).—While being escorted home by a friend of her husband's, she saw, by the moonlight, a man's face in the window of her house, which was thickly overgrown with vines. On coming into the room and striking a light, she saw nothing more, but later, coming out of her bedroom into the dark room, the face ("it was more a face than a figure") was seated in the arm-chair in the moonlight. She overcame her fear and seated herself in the arm-chair, and then the shape vanished without reappearing.

XXVI. Ivan Plesničar, of the Servian army medical service (refers to *Licht, mehr Licht*, vol. ii. 42, 51, vol. iii. 37).—"The figure of a tall old man, with a flowing beard and venerable countenance, in a grey toga with wide sleeves, seemed to lift out the window-frame and appear floating in its place, and gave me to understand, by gesture and motions (the right hand holding up a cross before me at a distance of about two metres), that I was to change the course of my life, which so far had been entirely given up to self-indulgence. . . I received an impression which up to the present time has proved indelible. Up to that time I was a materialist, and social enjoyments were my heaven."

(The narrator continues, in reference to a series of other hallucinations of which no details are given, "Sometimes other gentlemen were present, but they had not the slightest perception of what I saw.")

XXXI. C. Sophie T.—Detailed account of the vision of an angel seen by her when standing by the bedside of her dying child. The two elder children were playing in the next room. She was just repeating a *Paternoster* (it being the hour for service in church) when, after three taps with a willow wand, the angel (a wingless figure) appeared, bent over the child, and vanished. Her husband, entering the room immediately afterwards, remarked on her ecstatic expression. The child died in twenty-four hours.

XVI. 2. B. Captain Ko. (retired from the army).—"On October 25th or 26th, 1887, about 7 P.M., I was driving to tea with a friend after my usual dinner. I got out of the carriage, and remained standing in front of the little church of Schw., while my companion entered a house in the neighbourhood. I knew that my mother was ill, and feared that her condition might become more serious, but did not expect the worst. (In another place the narrator speaks of 'expecting an improvement.') Then I suddenly saw a black ball (of the size of a small balloon) rising up into the clear sky above the roof of the church. As it rose higher it lessened in size, and vanished in the direction of the moon, then, I think, in the first quarter, with one star above it (Venus). My feelings at the same time were extremely unpleasant; my consciousness was quite clear, but filled with the idea, 'Some misfortune is happening.' While I had not previously felt anxious, and my state of mind was, on other grounds, even a cheerful one, my first thought, of course, on seeing this appearance was of my mother, and this gave rise to uneasy, anxious feelings, so that later on, in company with my friends, it required an effort to control myself. Next day I found that my mother's condition had changed for the worse, and that she was unconscious; and on October 9th she died."

HALLUCINATIONS AFFECTING MORE THAN ONE SENSE.

XXIV. A. Louise Han.—See p. 238, Note 1.

XXIX.—See p. 280.

IX. 17. Frau Bö.—On Monday, September 23rd, 1889, between 1 and 2 A.M., Frau B. heard a moaning and lamenting outside her bedroom, immediately under the window looking on the Ka..strasse, in which the Realschule is situated. She was going to call her husband, but he was fast asleep. She was then about to pull the bed-clothes to waken him, when, at the same moment, she saw a white figure ("something white, which she took for a figure") float through the room, whereupon she hid herself under the bed-clothes. In the morning she related the occurrence to her husband, who laughed at her. She, however, thought some one must have died, probably her niece, whom she knew to be ill. About 9.30 A.M. there arrived a telegram from Munich announcing the serious illness of Chr. Schm., a master at the Realschule. Frau B. immediately said, "He will die." Soon there arrived a second telegram with news of the death of the gentleman in question.

P.S.—Herr Schm., before his departure in June, had handed over to Herr B. and his wife the sum of several hundred marks to take care of for him during his absence.

XV. 10. Dr. H. Gr.—See p. 96.

XXX. B. G. Wit. (schoolmaster).—"I was again in bed, three months later than the above occurrence (see XXX. A.), when suddenly I felt a violent blast of air on the right side. Then I felt a magnetic current pass from my head to my feet; I turned over on my other side and said, 'Now magnetise me on the left side too.' This was done. Then I laid myself on my back, and felt a strong current passing from head to foot. In a few minutes there was an appearance of luminosity, a patch of light, the length and breadth of my bed, reaching up to the ceiling of the room. A man's figure, which looked copper-coloured, appeared on the right side of the bed. He looked at me and I at him. No conversation took place. I was not afraid, but ordered the figure to withdraw, which he immediately did. The light also vanished with the figure. My wife was with me in the room, but she noticed nothing."

I. 13. Magd. Sp.—"I saw my mother after her death four weeks after the funeral (she died about Shrovetide, 1860). I was then living at Gundelfingen with my family. At first I saw a white dove every night for a week. It flew about in front of the window, appearing at twelve

precisely, and staying till five A.M. I could hear the fluttering; my sister saw the dove as well. After this appearance had ceased we heard footsteps; once, at midnight, the door opened of itself. We were sitting up, because we had been excited by the various noises. My mother entered, fully visible, in the clothes in which she had been buried. She lay down beside my sister and myself. (We were sleeping in the same bed, in the room she had died in.) She remained there till five; we had the feeling as if a corpse were lying beside us, and were so much frightened that we could not get out of the bed. This was repeated every night for a week. [When she went away?] we saw her go round the house. Whenever the church bell rang she slammed the door violently. In the last night we questioned her; she asked us to have a mass said. This was done and she appeared no more. My brother (then between twenty and thirty years of age and in the army) arrived one morning early and saw [and heard] my mother bustling about in the yard." (The two witnesses mentioned are no longer living.)

Auditory Hallucinations (Voices).

V. 17. Josepha Wa.—"When my husband died, on January 16th, 1873, and his corpse was still lying unburied in the mortuary, I heard in the night of the 17th, about 10 P.M., a voice call three times, 'Pepi.'[1] I awoke at the first call, and hearing it twice loudly repeated, I rose, thinking my father was calling me, and went to him. He had heard nothing. . . . He came, as I was afraid, and watched beside me. I was suffering at the time from headache and toothache, but otherwise quite healthy; I was also overwhelmed with grief at the death of my husband."

IX. 18. A. U. (schoolmaster.)—"My wife died on April 3rd, 1887, at 12.45 A.M. On awakening early—perhaps at 6 or 7 A.M.—I quite distinctly heard her dear voice calling me by name, 'August,' as if she wished to comfort me."

XVI. 2. A. Captain Ko. (retired).—See p. 98.

[1] Familiar abbreviation of Josepha.

XXX. C. G. Wit. (schoolmaster).—"In my young days I was called quite loudly one afternoon. On immediate inquiry I found that no one had called me. The voice was extremely loud and vigorous. It was not the voice of a human being. This took place at 2 P.M. I had lain down for a siesta, on a day when there was no afternoon school."

V. 19. A. Therese Fo.—"In November 1878 I heard, from my bed in our house at Munich, at 5 A.M., the singing of birds, as though it were spring. I was wide awake, quite healthy, free from excitement, and wondered at this unaccountable occurrence. Several hours later we received a telegram informing us that a cousin with whom we were very intimate . . . had died unexpectedly that morning at five precisely. We had not been thinking of him at the time."

IX. 14. B. Schm. Fr. (Government schoolmaster.)—In the year 1869 he was frequently in X. on business connected with the erection of a church in that place. X. was a village some nine miles distant, in a north-westerly direction, from B. Near this village is a quarry, and just above it stands a tree, past which the footpath leads. As he was passing this tree one day at noon, no one else being in the neighbourhood, he heard a loud sneezing. The sound appeared to proceed from the depths below the tree. He thought that there might be some one in the quarry and passed on. When he, some time after, again took the same road he again heard the same loud sound of sneezing. This excited his attention. At midnight of the same day he passed the same spot with the clergyman who then officiated in X.; again the mysterious sneezing. Schm. Fr. called the clergyman's attention to it, who then told him that he had often heard it both by day and by night, and not he alone, but all, from the oldest man to the youngest child in his congregation; that it was well known in the neighbourhood. The saying ran that here a poor soul was imprisoned and was waiting for deliverance. A little later on Coll. Schm. Fr. again passed the tree. This time, as before, no one was near. He was deep in thought about the plans of the church and did not remember the haunted spot. Suddenly he again heard loud, vigorous sneezing. He said fearlessly, "God help thee and me." Quite

distinctly he heard, as from the depths, "Thank God." And since then the sneezing has not been heard.

AUDITORY HALLUCINATIONS (NOISES, ETC.).

II. 3. Math. G.—"I heard in my house, about three weeks ago, at half-past nine in the evening, three raps, five times repeated, upon the table. I was lying in bed half-asleep, but at the first sound became wide awake, and then heard the raps in succession. . . . I thought it was a manifestation, because the raps were at regular intervals. On the following day I learnt that a relative of mine, living in service at Donauwörth, had died at the same hour. In life I had known her intimately (had been in love with her). My uncle at once communicated with me. . . . When I heard the taps I did not think of the young girl, for though she had been in ill-health for six months, her death was not expected. She was twenty-one years of age. Two girls were sleeping in the room next mine; one of them, her niece (a seamstress), heard the same sounds."

III. 22. A. Louise Ed.—"Towards two o'clock one morning in May 1888, Herbststrasse, No. 7, II., my husband and I heard a glass door being broken into, and could distinguish the sound of the fragments of glass falling and breaking. We simultaneously awoke and got up. He exclaimed, 'What is the meaning of this?' We found nothing broken; indeed, there was no glass door in the house. Three weeks after this occurrence my father unexpectedly died of inflammation of the lungs, after keeping his bed for six days. At the time when we heard the noise my father was quite well, and lived in the country at Simbach, but always had a great longing to see us and the children. Since my father's death I have often seen him in dreams . . . but without any special significance. I am a great dreamer. Once I dreamt that my son had died at sea. I wrote to him and found it untrue."

III. 23. Simon Ed.—Compare p. 276 (the same case as III. 22. A.).

V. 1. Maria G.—"In the summer of 1880 I was lying awake in bed, alone in my room, in my parents' house in L——. About midnight, without any apparent cause, the door flew wide open, so that I could see into the passage.

Awakened by the sound of the door, I did not go to sleep again. Thereupon I heard heavy footsteps, going first along the passage, then up the stairs. I struck a light and hastened out, but found no one. At the same hour my favourite aunt, who was seventy years old, died in a house not ten minutes' walk from our own, without any possibility of our having been able to foresee or expect her death. I only learnt the news on the following day, and had not been thinking of her during the night."

V. 18. A. Frau K.—"On the 27th of December 1876, at half-past two in the afternoon, I was in my kitchen at the Deaf and Dumb Asylum in B——. I was unmarried at the time. Suddenly I heard beside me the splashing of water, for which I could discover no cause. The sound continued, at intervals, for an hour (from 1.30 to 2.30). On the same day I learnt that my sister (twenty-four years old) had died, at the time already mentioned, in a hospital in Munich, of heart disease, without my having any idea of her danger, for the last reports had been favourable. When I heard the sound it did not trouble me, and I did not think of my sister."

"One afternoon in the November of 1886 I was alone in my room (I was then married), when, between four and five o'clock, I heard a sound as of a heavy body falling beside me, like a rap, only sounding once. In the evening I learnt that my friend, the Rev. Dr. Wagner, had died at exactly the time mentioned, at the age of seventy-four years. They had been fearing a repetition of a stroke. [Still] I did not know that on that same afternoon he had had a seizure, and had succumbed to it."

V. 19. B. Theresa Fo.—"My husband died on the 15th November 1881. On the preceding night I heard a loud cracking sound in my house (at Neuhausen, near Munich), which I could not account for in any imaginable way, for it was much louder than the creaking of furniture. My husband was lying ill in bed, and heard it too. I was well, not at all excited [? !], and wide awake. I was much frightened. The day after my husband died."

IX. 14. A.—A Government schoolmaster (Schm. Fr.), while studying at the former Polytechnic School at N——, sat up to study one night—January 1846—and did not go to bed until 1 A.M. He could not sleep until nearly two,

when a terrible crash came against his bedroom door. Two days afterwards he received a letter containing the news that exactly at the same time his godfather had died at B——.

IX. 19. A. C. Kü.—"It was about midnight when we, my father, mother, and two brothers, who slept in two adjoining rooms, were awakened by a violent tapping at the window three times repeated. My father got up, opened the window, and looked for the cause. At the same moment there were three taps at the other window; but my father, hastening to it at once, could not discover anything there either. Then my mother exclaimed, weeping, 'Your grandfather is worse; he is certainly dead; this is an omen.' And so it proved. The next morning a messenger arrived with the news that grandfather had died at midnight."

X. 14. A. Martha Br.—"When I was a girl of fourteen I heard a loud knocking. My uncle, who was living in Paris, died at the same hour as the knocking had been heard at the door. My mother and I looked out, without being able to discover the cause for it. At the same time the clock stopped."

X. 19. Charlotte La.—"In the June of 1879, one day at eight o'clock in the evening, I was in the kitchen at Örebro (in Sweden). My father was busy packing in the drawing-room. I thought that I heard the sound of a guitar in this room, and expressed my surprise to my mother (who did not hear it) that my father should be so merry and should be playing just before his departure. The music was cheerful, some well-known melodies which my father was in the habit of singing and playing. At eleven o'clock the same evening my father started for Germany, in order to visit my grandmother at Nuremberg. On the following morning, while my father was still on the road, we received a telegram, saying that my grandmother had unexpectedly died at the age of seventy-five. I had heard the playing one month before as I lay in bed. It woke me up and frightened me. The tendency to second-sight and presentiments is hereditary in our family. My father, mother, and paternal grandfather were all alike in this respect. I am in good health."

XII. 13. A. Ferd. Schm.—"After an absence of many years I had returned to the house I was born in. This house was built in the sixteenth century, formerly belonged

to the monastery of St. Michael, and was first lived in by a bishop. On the first floor were some bedrooms, divided by lath partitions, and having old-fashioned stuff hangings. Since my childhood only one death had taken place here; when I was eight years old my father died, about Christmas 1876. A suicide (by hanging) had taken place here somewhere between the years 1850 and 1860. According to my diary, I heard the sound of furtive or careful footsteps on February 16th, just after I had gone to bed at 11.30 P.M. I called several times, but received no answer. Something was creeping up to my chamber door. I had seized some object with which to defend myself, and waited, in the greatest tension of excitement, for what was coming. I distinctly heard the opening of the door, and asked—almost in a shriek—who was there, but received no answer, and could think of no explanation, as the sounds were not so distinct as the noises made by rats and mice. Judging by the cautious steps, I thought at first it might be my grandmother, who was then ill, and must certainly have been in bed at that hour. She may have had her thoughts strongly directed to me. The doctor had pronounced it impossible for her to live long. Her death took place on the 10th of March following."

XII. 13. B. Ferd. Schm.—"Herr Li—— and my mother were in the sitting-room, late one evening, when both suddenly heard the front door open, there was a clink [of the latch?], and some one came up the steps, crossed the passage, passed the three steps leading to the kitchen, and then went through the kitchen to the door of the sitting-room. My mother stood in the middle of the room, awaiting the nightly visitor, but there was no knock, neither was any one in the kitchen when both went out." (This is said to have happened in the autumn of 1888.)

XV. 5. Von T.—"At Würzburg, between 6 and 8 P.M. (I cannot remember the exact date—I think it was in the spring of 1888), I heard a noise as if a stone had been thrown at the window, or a heavy blow struck on it. I was just talking to my landlady, Frau B——, and in a completely normal and healthy condition. My landlady heard the blow, started violently, and expressed her belief that her sister-in-law (then living at Würzburg, and seriously ill) had died, and was announcing herself. At the hour when we

heard the blow, Frau B——'s sister-in-law died. The window-panes, when we examined them, were quite intact."

XVI. 1. Meta v. O.—See p. 240.

XVII. 2. Frl. Mei.—See p. 239.

XVII. 17. A. Antoinette and Ella Dr.—"My mother, my two sisters, and myself were one afternoon in our sitting-room at M——. We were talking together. All members of the family who were present were, like myself, fully awake and free from all excitement. The door opening on the passage was shut. Suddenly it flew open without apparent cause, and all of us at once heard a heavy blow in the room for which we could assign no reason. We were greatly startled, and my mother said it was a warning. On the following day we heard that my uncle, living at E——, had suddenly and unexpectedly died of heart-disease at the exact time when we heard the blow."

XVII. 17. B.—"At the time of my father's death I suddenly heard a loud knock while I was busy in the kitchen. The plates rattled on a fixed rack, without assignable cause. My [?] was present, and thought that this was a warning. During the night which followed, my father (who was in the house, and already ill) died."

XXV. . . . Frau Dro.—"I heard one deep sigh. It was on November 20th, 1883. I was alone on the second floor, standing at a linen-cupboard, and heard the deep sighing in the direction of the door which led to the corridor. There was no possibility of delusion. My state of mind was quite calm, and I thought no more of the matter. On November 23rd, in the same year, my sister died in the same house, in a room on the third floor; but I was not thinking of her the moment before hearing the sigh. It is true that I thought of her immediately after hearing it."

XXXVI. 1. Marie K.—"To the best of my recollection, it was in the winter of last year that I was in the sitting-room at 3 P.M. with my cousin M——. I was reading a book, my cousin was sewing, when we heard a heavy blow and were frightened. It sounded as though a tile had fallen down in the chimney. When my cousin examined the fireplace she could find nothing. My uncle died at exactly the same time, as I heard some days later. He was very old and infirm, living at Passau. I had never personally known him. Both of us had heard, for a fortnight, a sound like

the ticking of a clock, which went on day and night and stopped at the moment when we heard the blow."

XXXVI. 2. A. (Abbreviated.)—Frau Z—— heard continual knocking for some days previous to three deaths—those of her father, brother, and father-in-law. It was heard only before deaths, and ceased each time with the death. In two out of the three cases the death occurred at a distance from the place where Frau Z—— lived.

Tactile Hallucinations.

II. 9.—See p. 279.

IX. 18. B. U. (schoolmaster).—"On April 5th, 1887, at 3 P.M. I felt—it is true I was only half awake—my right hand pressed, just as though my wife had done it. Probably she wished to comfort me, as this took place about an hour before her funeral."

XV. 2. Wally R.—See p. 241, Note 1.

Dreams, Presentiments, Warnings,—Cases Where the Hallucination is Described too vaguely.

XXXVIII. Re.—See above, p. 75.

XXIV. B. Louise Han—(Dream?).—"This summer I saw my own face, covered with an eruption, beside my bed. I sat up, to try to seize the vision, when it vanished. I felt vexed at this, and went to sleep. Next morning I found myself so weak that I could scarcely stand upright. I did not eat or drink all day, but sat in the open air. In the evening I went to bed early; next day I was well, but felt a strange burning in my face. When I felt the eruption coming on, I bathed my face with arnica, and so got rid of it. I should never have thought of this, had I not seen the vision two days before."

XXX. D. G. Wit. (schoolmaster) gives a brief report of dreams, and writes, "I have often had warnings of the deaths of my relations."

IX. 19. B. C. Kü.—"The death of my grandmother was announced by remarkable circumstances. An excellent Schwarzwald clock suddenly stopped, though it had been

wound up at the proper time, and the weights (which took a week to run down) were still a good way up. My grandmother died at the very hour to which the hands were pointing when they stopped, as my mother soon after heard from a messenger, arriving from the place where my grandmother lived—a four hours' walk from us."

XXXVI. 2. B. Frau St.—"When my mother's sister unexpectedly died (at a distance) the clock on our wall suddenly ran down. My mother (now dead) and I both heard it, and could not explain it. It was quite a good clock, and went again after the weights had been drawn up. This never happened on any other occasion. The hand stopped at the time of her death—which we only heard of later."

I. A. Hieb.—"In June, 1846, when I was living in my father's house at Dillingen, we found, one morning, a board—the lower part of a step, which had been quite firmly nailed in—lying loose on the stairs. The nails (long board-nails) were sticking in it. In the same night in which the stairs had so unaccountably been made impassable, my half-brother died. He was man-of-all-work (Hausknecht) at the monastery of Medingen—two hours distant. He had been ill with a stomach complaint. None of us has any inclination to somnambulism. No one heard the wood being wrenched out—we were all asleep when it happened. It had previously been so firmly fastened in that it could not have been loosened, even with an axe."

V. Franz J. Schu. and Barbara Schu.—In the summer of 1875, between midnight and 2 A.M., in the house of Sch——, a large window-jamb, which had been placed in the attic and was leaning against the roof, between 1 and 2 metres distant from the top of the stairs, fell down the stairs with a loud noise. At Ebbisburg, a sound was heard, as if tiles from the roof were falling down into the attic. Awakened by this noise, the family heard next day that a near relative had died at the same time. He had been ill for some time, but his death was not expected.

XXX. A. G. A. Wit. (schoolmaster).—"One evening, eight years ago, I was in bed: My wife's bed was next to mine; we were conversing. In a pause of the conversation, I was raised a quarter of an ell into the air. I said, 'Do stop that nonsense.' Then I was gently lowered again. I

did not think of spiritism. I was wide awake and in no way excited; I was also quite well and free from anxiety. My wife noticed nothing. Soon after this, my uncle, the Rev. X., died, after the apparition of a spirit in broad daylight, at 12 noon."

XXI.—C. T. went, in the autumn of 1868, to escort an acquaintance of his to her home, after a visit to her grandmother, who was ill. He suddenly had a well-defined presentiment that the grandmother would die next morning at 7 A.M. Next morning, at that hour, she appeared to him in a dream, and said, "Good morning, Herr T——." He sent over at once to inquire, and heard that she had just died. (He had, on the previous evening, told the grand-daughter of his presentiment.)

In the year 1870, again, after the death of his wife, T. had a presentiment that two more deaths would occur in the house. The presentiment came true.

APPENDIX II.

Tabular Conspectus of the Statistics of Waking Hallucinations.

In the following conspectus there are published, in the first place, the figures of the English census as given in the Report. But these are supplemented, as far as I found it possible to do so, by the addition of the American, French, and Munich results.

The final figures of the English Collection here cited differ slightly from the *ad interim* tables which were quoted in Chapters III. and IX. The differences, which are mainly due to the adoption in the Report of different methods in dealing with the results, are, however, trifling, and do not in any wise affect the conclusions arrived at in the text.

For kind permission to publish the Tables I must here express my best thanks to the English Society for Psychical Research, and the Munich Psychologische Gesellschaft,—especially to Professor Sidgwick and Baron von Schrenck-Notzing.

TABLE I.—NUMBER OF AFFIRMATIVE AND NEGATIVE ANSWERS RECEIVED, AND PROPORTION PER CENT. OF THE FORMER TO THE TOTAL.

COLLECTED		ANSWERS RECEIVED.						Percentage of Affirmative Answers.
		Affirmative.				Negative.	Total.	
		Details Given.		Details not Given.	Total.			
		First Hand.	Second Hand.					
By S.P.R.	Men	496	83	76	655	7,717	8,372	7.8
	Women	753	162	114	1029	7,599	8,628	12.0
	Total	1249	245	190	1684	15,316	17,000	9 9
By L. Marillier	Men	65	209	78	352	1,952	2,304	15.27
	Women	87	160	80	327	762	1,089	30.02
	Total	152	369	158	679	2,714	3,393	20.01
By W. James[1]	Men	—	—	—	411	3,334	3.745	10.97
	Women	—	—	—	441	2,125	2,566	17.14
	Total	—	—	—	852	5.459	6,311	13.5
At Munich	Men	—	—	—	20	316	336	5 95
	Women	—	—	—	31	258	289	10.72
	Total	—	—	—	51	574	625	8.16

[1] According to a later communication from Professor James, the total number of answers received was 7123, of which 1051 (=14.75 per cent.) are affirmative. Of these affirmative answers, however, 429 are without details and 86 without signature.

TABLE I. A.

COLLECTED	FROM MEN.			FROM WOMEN.			TOTAL.		
	TOTAL.	Affirmative Answers.	Percentage of Affirmative Answers.	TOTAL.	Affirmative.	Percentage.	TOTAL.	Affirmative.	Percentage.
In England .	8,372	655	7.8	8,628	1,029	12.0	17,000	1,684	9.9
By L. Marillier	2,304	352	15.27	1,089	327	30.02	3,393	679	20.01
By Prof. James	3,745	411	10.97	2,566	441	17.14	6,311	852	13.5
In Munich . .	336	20	5.95	289	31	10.7	625	51	8.16
Total . .	14,757	1,438	9.75	12,572	1,828	14.57	27,329	3,266	11.96

N.B.—(1.) The figures of the "second-hand" column are to be understood as meaning that the occurrence of the hallucination was communicated by the percipient himself, but the details of the experience have been obtained at second, in a small number of instances at third or fourth hand. (2.) The figures of M. Marillier's census contain (in the version printed in the Report of the London Congress) a few trifling errors in calculation. The correction of these has caused the discrepancy between the tables as there printed and those given here. (3.) The figures for Munich relate to information collected up to December 1893.

TABLE II.

WAKING HALLUCINATIONS CLASSIFIED ACCORDING TO THE SENSE AFFECTED, AND ACCORDING TO THE KIND OF PERCEPT.

Preliminary Observations.—While in Table I. the number of persons experiencing hallucinations is in question, the following table concerns the number of hallucinations reported, the two sets of numbers differing from one another, as not a few persons have more than one such experience to report. Each separately described hallucination is reckoned by itself; cases occurring repeatedly, not separately described, are counted as one (*e.g.*, in the English census in the case of 111 narratives of visual hallucinations given at first-hand and 29 of the same at second-hand, and in a still greater number of auditory and tactile cases. Cf. Tables V., VI., VII.)

In the calculation of column 15 the number of persons answering is reduced in the same proportion as the number of affirmative answers is reduced by the omission of those answers in which no further particulars were given (Cf. Table I.). In the English census, *e.g.*, we find 1295 cases of visual hallucinations (first and second-hand cases added together)—*i.e.*, about 8.4 per cent. of 17,000 $\times \frac{1684 - 190}{1684}$. In the German census a detailed explanation is added to almost every affirmative answer; here all cases have been taken into consideration. As for the American census, I have not had access to the necessary statistics, which is also the case with the French. Of the latter, however, I was able to use the provisional results up to April 1st, 1891. (See *Proceed. S.P.R.*, Part xix., pp. 264-267.) At that time 2822 answers had been received, of

which 472 were affirmative. As only 231 of these had explanations appended, column 15 is here reckoned from $2822 \times \frac{231}{472} = 1363$. In Table II. *d*, therefore, $15130 + 1363 + 625 = 17118$ answers are taken into account.

Columns 1, 2, 3, 8, and 9 contain the cases which, according to the report, belong to the most distinctly externalised, those, *i.e.*, which looked exactly like human beings, animals, or objects. Under 1, besides phantasms of the living, those apparitions whose prototype was already dead have been reckoned, if the percipient did not know of the death, and if it had taken place not more than twelve hours before the hallucination. Column 4 contains visual images incompletely developed, such as transparent, colourless, or shadowy and indistinct figures, apparitions of *parts* of the human body, and figures which, though apparently having a bodily form, are veiled. By "Visions," 5, are to be understood scenes which do not appear to take place in the real surroundings of the percipient. Sometimes they are distinctly externalised, sometimes only visible to the mental eye. Column 11 contains appearances not clearly seen by the percipient, not identified by him, or to which he was unable to give a name; also such appearances as smoke, cases of dark shadows between the observer and the lamp, a black ball rising into the sky like a balloon, and (in the German report) sighs, or sounds like tapping at the windows, chairs falling over, etc.

TABLE II. A.—ENGLISH CENSUS.

	1 Realistic Phantasms, Voices, etc.		2		3		4 Incompletely developed Apparitions.		5 Visions.		6 Angels and Religious Phantasms.		7 Grotesque, Horrible, or Monstrous Apparitions.		8 Animals.		9 Definite Inanimate Objects.		10 Lights.		11 Indefinite Objects or Touches.		12 Insufficiently described for Classification.		13 TOTALS		14 TOTALS.			15
	Of Living Persons.		Of Dead Persons.		Unrecognised.																									
	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	First Hand.	Second Hand.	Number of Hallucinations per cent. of Persons answering.
Visual	296	36	105	22	272	47	120	12	18	9	10	3	23	6	22	11	10	2	14	1	14	—	8	12	912	161			
Visual & Auditory (vocal).. ..	30	1	41	3	10	—	1	—	—	1	1	—	1	—	—	—	—	—	2	—	1	—	—	—	87	5			
Visual & Auditory (non-vocal)	7	—	4	—	24	2	13	—	3	—	—	—	7	—	3	—	3	—	1	—	2	1	—	—	67	3	1120	175	8.4
Visual & Tactile ..	13	—	7	2	4	—	5	3	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	31	5			
Visual & Auditory (vocal) & Tactile	5	—	6	1	4	—	2	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	19	1			
Visual & Auditory (non-voc.) & Tactile	1	—	—	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—			
Auditory (vocal) ..	172	42	57	13	144	58	—	—	—	—	4	3	—	—	—	—	—	—	—	—	—	—	—	—	377	116			
Auditory (vocal) & Tactile	6	—	4	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	—	388	116	3.3
Tactile	6	—	8	2	55	12	—	—	—	—	—	—	—	—	2	1	2	—	—	—	35	14	—	—	108	29			
Tactile & Auditory (non-vocal) ..	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	6	—	114	29	.9
Totals	536	79	232	43	520	119	143	15	21	10	16	6	33	6	27	12	16	2	17	1	53	15	8	12	1622	320			

TABLE II. B.—FRENCH CENSUS.

	1	2	3	4	6	8	9	11	13	14	
	Realistic Phantasms, Voices, etc.										
	Living.	Dead.	Unrecognised.	Parts of Human Body.	Angels.	Animals.	Inanimate Objects.	Indefinite Objects, Noises.	TOTAL.		Number of Hallucinations per cent. of Persons answering.
Visual	24	20	27	3	1	2	13	—	90		
Visual and Auditory ...	4	7	8	—	—	—	1	—	20		
Visual and Tactile ...	—	2	3	—	—	—	—	—	5		
Visual and Olfactory ...	—	1	—	—	—	—	—	—	1	122	8.9
Visual, Aud., Olfactory	1	1	3	—	—	—	—	—	5		
Vis., Aud., Olf., Tactile	—	—	1	—	—	—	—	—	1		
Auditory...	10	4	41	—	—	—	—	41	96	98	7.1
Auditory and Tactile ...	—	2	—	—	—	—	—	—	2		
Tactile	1	9	—	—	—	—	1	—	11	11	0.8
Totals	40	46	83	3	1	2	15	41	231	231	—

TABLE II. C.—MUNICH CENSUS.

	1	2	3	8	9	11	13	14	15
	Phantasms, Voices, etc. of			Animals.	Definitely Recognised Non-vocal Sounds.	Indefinite.	TOTAL.		Number of Hallucinations per cent.
	Living.	Dead.	Unrecognised.						
Visual	8	7	7	—	1	1	24	30	4.64
Visual and Auditory .	1	—	1	—	—	1	3		
Visual and Tactile	1	—	1	—	—	—	2		
Visual, Aud., Tactile	1	—	—	—	—	—	1		
Auditory (Vocal). .	—	2	2	1	1	—	6	26	4.32
Auditory(Non-Vocal)	—	—	—	—	2	18	20		
Tactile	—	2	—	—	1	—	3	3	0.48
Totals . . .	11	11	11	1	5	20	59	59	—

TABLE II. D.—GENERAL RESULT.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Realistic Phantasms, Voices, etc.														
	Of the Living.	Of the Dead.	Unrecognised.	Incompletely developed Phantasms.	Visions.	Angels and other Religious Phantasms.	Grotesque, Horrible, or Monstrous Apparitions.	Animals.	Definite Inanimate Objects.	Lights.	Indefinite Objects or Touches.	Insufficiently described for Classification.	TOTAL.		Number of Hallucinations per cent. of Persons answering.
Visual	364	154	353	135	27	14	29	35	25	15	15	20	1187		
Visual and Auditory	43	55	45	14	4	1	8	3	4	3	5	—	185		
Visual and Tactile .	14	11	8	8	—	—	2	—	—	—	—	—	43	1441	8.4
Visual and Olfactory	—	1	—	—	—	—	—	—	—	—	—	—	1		
Vis., Aud., Tactile	8	8	9[1]	4	1	—	—	1	—	—	—	—	31[1]		
Auditory	224	76	245	—	—	7	—	1	3	—	59	—	615		
Aud. and Tactile .	6	6	6	—	—	—	—	—	—	—	1	—	19	634	3.7
Tactile	7	21	67	—	—	—	—	3	3	—	49	—	151	151	0.88
Totals . . .	666	332	733	161	32	22	39	43	35	18	129	20	2232	2232	—

[1] In one of these cases, smell was included as a fourth sense.

TABLE III.—HALLUCINATIONS CLASSIFIED ACCORDING TO THE AGE OF THE PERCIPIENT.

ENGLISH CENSUS.

	Under 10.	10—19.	20—29.	30—39.	40—49.	50—59.	60—69.	70 & over.	Unstated.	Total.
Visual Hallucinations	72	217	300	143	81	40	22	5	415	1295
Auditory Hallucinations . . .	3	42	91	38	21	14	5	—	290	504
Tactile Hallucinations . . .	1	11	32	17	14	3	1	—	64	143
Total . .	76	270	423	198	116	57	28	5	769	1942

NOTE.—Of the 17,000 answers received in the English census, 6,521 indicated the percipient's age. The average age of these 6,521 was about 40. I have not seen the statistics of age given in the French or the American census.

TABLE IV.—WAKING HALLUCINATIONS CLASSIFIED ACCORDING TO THE NATIONALITY OF THE PERSONS ANSWERING. (SECOND-HAND CASES ARE INCLUDED.)

ENGLISH CENSUS.

	English-speaking.				Russians.				Brazilians.				Other Nations.			
	No. of Persons Answering.			Percentage of Affirmative Answers.	No. of Persons Answering.			Percentage of Affirmative Answers.	No. of Persons Answering.			Percentage of Affirmative Answers.	No. of Persons Answering.			Percentage of Affirmative Answers
	No.	Yes.	Total.		No.	Yes.	Total.		No.	Yes.	Total.		No.	Yes.	Total.	
Men	7167	567	7734	7.3	300	34	334	10.2	167	50	217	23.0	83	4	87	4.6
Women	7274	932	8206	11.4	272	74	346	21.4	34	13	47	27.7	19	10	29	34.5
Total	14441	1499	15940	9.4	572	108	680	15.9	201	63	264	23.9	102	14	116	12.1

	Number of Hallucinations.			Per cent. of Persons Answering.	Number of Hallucinations.			Per cent. of Persons Answering.	Number of Hallucinations.			Per cent. of Persons Answering.	Number of Hallucinations.			Per cent. of Persons Answering.
Visual	947				86				31				9			
Visual and Auditory (vocal)	68				17				5				2			
Visual and Auditory (non-vocal)	52				9				9				—			
Visual and Tactile	30	1109		7.8	3	124		18.6	2	50		19.3	1	12		12.9
Visual and Auditory (vocal) and Tactile	9				9				2				—			
Visual and Auditory (non-vocal) and Tactile	3				—				1				—			
Auditory (vocal)	425	434		3.0	29	23		4.3	37	39		14.8	2	2		2.2
Auditory (vocal) and Tactile	9				—				2				—			
Tactile	127	132		0.9	6	7		1.0	4	4		1.5	—	—		—
Tactile and Auditory (non-vocal)	5				1				—				—			
Undescribed	192				2				—				3			

The numbers of the Munich Census are too small to be of any value.

TABLE V.—VISUAL HALLUCINATIONS IN THE ENGLISH CENSUS.[1]

A.

VISUAL HALLUCINATIONS DIVIDED ACCORDING TO DATES.

	Hallucinations within the last 10 years.	More than 10 years ago.	Undated.	Totals.
Realistic human apparitions of living persons	157	166	29	352
Of dead persons	62	85	16	163
Unrecognised	126	140	49	315
Incompletely developed apparitions	60	74	9	143
Visions	8	10	3	21
Angels and religious apparitions, etc.	4	5	3	12
Grotesque, horrible apparitions, etc.	6	24	3	33
Animals	12	7	6	25
Definite inanimate objects	5	6	3	14
Lights	12	4	1	17
Indefinite objects	8	8	1	17
Totals	460	529	123	1112

[1] Tables V., VI., VII. contain only first-hand cases; narratives where the details were insufficient for classification have also been excluded.

TABLE V. B.

VISUAL HALLUCINATIONS DIVIDED ACCORDING TO CONDITIONS OF PERCEPTION.

	Immediately after Waking.	Percipient Awake in Bed.	Up, Indoors	Out-of-Doors	Unstated.	Totals.
Realistic human apparitions of living persons .	43	77	149	70	13	352
Of dead persons . .	8	46	74	19	16	163
Unrecognised . . .	36	90	111	67	11	315
Incompletely developed apparitions . . .	24	50	47	19	3	143
Visions	2	4	11	4	—	21
Angels and religious apparitions, etc. . . .	—	5	3	2	2	12
Grotesque, horrible apparitions, etc. . . .	6	13	2	10	2	33
Animals	2	4	13	3	3	25
Definite inanimate objects	1	2	11	—	—	14
Lights	6	2	6	3	—	17
Indefinite objects . .	1	1	11	4	—	17
Totals . .	129	294	438	201	50	1112
	423		639			

TABLE V. C.—TABLES A AND B COMBINED.

			Within the last 10 years.	More than 10 years ago.	Unstated.	Totals.
Realistic Human Apparitions.	Of Living Persons.	Immediately after waking	16	24	3	43
		Awake in bed	31	43	3	77
		Up	78	64	7	149
		Out-of-doors	31	31	8	70
		Unstated	1	4	8	13
		Totals	157	166	29	352
	Of Dead Persons.	Immediately after waking	5	3	—	8
		Awake in bed	19	25	2	46
		Up	26	42	6	74
		Out-of-doors	9	10	—	19
		Unstated	3	5	8	16
		Totals	62	85	16	163
	Unrecognised.	Immediately after waking	18	10	8	36
		Awake in bed	31	54	5	90
		Up	47	42	22	111
		Out-of-doors	30	33	4	67
		Unstated	—	1	10	11
		Totals	126	140	49	315
Incompletely Developed Apparitions.		Immediately after waking	12	12	—	24
		Awake in bed	19	29	2	50
		Up	23	20	4	47
		Out-of-doors	5	12	2	19
		Unstated	1	1	1	3
		Totals	60	74	9	143
All other Visual Hallucinations.		Immediately after waking	9	5	4	18
		Awake in bed	3	24	4	31
		Up	27	22	8	57
		Out-of-doors	14	12	—	26
		Unstated	2	1	4	7
		Totals	55	64	20	139

TABLE VI.—AUDITORY HALLUCINATIONS. ENGLISH CENSUS.

INCLUDING THOSE IN WHICH SOME OTHER SENSE IS AFFECTED AT THE SAME TIME, DIVIDED ACCORDING TO DATE AND ACCORDING TO CONDITIONS OF PERCEPTION.

	Recognised as the voice of a living person.				Recognised as the voice of a dead person.				Unrecognised.				Totals.			
	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.
Percipient's name only—																
Percipient in bed .	16	6	5	27	9	3	1	13	11	3	2	16	36	12	8	56
,, up . .	33	16	15	64	8	8	3	19	21	6	6	33	62	30	24	116
Unstated . . .	5	4	26	35	1	—	5	6	1	2	17	20	7	6	48	61
Words other than the Percipient's name—																
Percipient in bed .	15	16	2	33	22	11	—	33	15	14	4	33	52	41	6	99
,, up . .	14	10	3	27	10	10	—	20	10	12	4	26	34	32	7	73
Unstated . . .	—	—	—	—	—	—	—	—	1	1	3	5	1	1	3	5
Voices (no definite words heard) or experiences described as "Voices"—																
Percipient in bed .	2	2	—	4	2	3	—	5	3	—	2	5	7	5	2	14
,, up . .	12	2	3	17	3	4	3	10	6	1	2	9	21	7	8	36
Unstated . . .	2	—	6	8	—	—	3	3	1	1	21	23	3	1	30	34
Totals . .	99	56	60	215	55	39	15	109	69	40	61	170	223	135	136	494

TABLE VII.—TACTILE HALLUCINATIONS. ENGLISH CENSUS.

INCLUDING THOSE IN WHICH SOME OTHER SENSE IS AFFECTED AT THE SAME TIME, DIVIDED ACCORDING TO DATE AND ACCORDING TO CONDITIONS OF PERCEPTION.

	Touches associated with Human Beings.												Touch of an Animal or Inanimate Object.				Indefinite.				Totals.			
	Living.				Dead.				Unrecognised.															
	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.	Within the last 10 years.	More than 10 years ago.	Undated.	Totals.
Percipient touched — In bed	9	6	1	16	8	5	2	15	18	7	4	29	1	1	—	2	4	2	5	11	40	21	12	73
Percipient touched — Up	12	3	—	15	8	1	2	11	21	9	8	38	1	1	1	3	8	3	5	16	50	17	16	83
Percipient touched — Unstated	—	—	—	—	—	—	—	—	2	—	5	7	—	—	—	—	1	1	8	10	3	1	13	17
Percipient touching — In bed	—	1	—	1	—	1	—	1	3	1	—	4	—	—	—	—	—	—	—	—	3	3	—	6
Percipient touching — Up	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Percipient touching — Unstated	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals	21	10	1	32	16	7	4	27	44	17	17	78	2	2	1	5	13	6	18	37	96	42	41	179

TABLE VIII.—COINCIDENCES. A.—ENGLISH CENSUS.[1]

	Within the last 5 years.		Between 5 and 10 years.		More than 10 years ago.		Undated.		TOTALS.	
	First-Hand.	Second-Hand.	First-Hand.	Second-Hand.	First-Hand.	Second-Hand.	First-Hand.	Second-Hand.	First-Hand.	Second-Hand.
The apparition coincided with the death of the person seen ...	5 times	2	5	1	55	—	2	2	67	5
Other coincidences	11	1	4	1	9	—	1	—	25	2
No coincidence ...	84	3	50	1	99	5	23	19	256	28
Totals ...	100	6	59	3	163	5	26	21	348	35

[1] This Table is based on *ad interim* figures: no corresponding Table appears in the final Report.

TABLE VIII. B.—MUNICH CENSUS.

	Within the last 5 years.	More than 5 years ago.	TOTALS.
The apparition coincided with the death of the person seen	2	3	5
No coincidence . .	3	3[1]	6
Totals . .	5	6	11

[1] These three cases (cf. Appendix I.: cases xxxi. a. b. d.) were narrated by one and the same person; these figures, therefore, also point in the direction indicated on pp. 275 *sqq.*

INDEX OF AUTHORS.

ABERCROMBIE, 51, 58, 59
Acker, 25, 26
Ackermann, 32
Albers, 56
Alt, 22
Anjel, 281
Aristotle, 3, 51
Arndt, 230
Arnold, 18
Aschaffenburg, 48, 322
Asmus, 34
Athenodorus, 78
Atkins, 168
Aubanel, 13, 26, 30
Audin, 79
Auzouy, 28

BAGINSKY, 179
Bahnsen, J., 189
Baillarger, 16, 21, 23. 38, 118, 119, 238, 244
Bakewell, 171
Ball, 16, 25, 174, 262, 266
Baren, Cohen v., 34
Barrett, F. W., 205
Bartens, 44
Bartisch, 161
Baruk, 25, 26
Beattie, 58
Béclard, 175
Becquet, 72
Behr, 4
Benedict, 3
Beneke, 189
Bennet, 33
Bergmann, 165
Berkhan, 85
Bernhardt, 4, 269
Bernheim, 61, 62, 104, 130, 200, 215-216, 232, 240, 278, 285
Bert, 131
Bessus, 80
Bidder, 131
Biëlski, 157, 160
Billot, 33
Binet, 119, 130, 137, 149, 175, 198, 200, 219, 222, 230 *et seq.*
Binz, 50, 56
Blau, 8
Bleuler, 229
Blumröder, 3, 30, 33
Bodinus, 65, 77
Boëns, 40
Boerhaave, 44
Boerner, 56, 57
Bois-Reymond, Du, 131
Bones, 45
Bottentuit, 44
Bottex, 14, 33, 111, 159
Bound, 19
Boureau, 44
Bourneville, 40
Brach, 201, 246
Braid, 309
Braumüller, Pater, 312
Brenner, 177
Brewster, 200
Brierre de Boismont, 14, 26, 29, 33, 34, 38, 42 *et seq.*, 74, 77, 97, 114, 120, 202, 325
Bright, 174
Briquet, 46, 166
Broca, 269
Buccola, 177
Buch, 174
Buchholz, 50

Burckhardt-Préfargier, 253, 268
Burdach, 16, 189
Burke, 64
Burnett, 8
Busch, 162

CALMEIL, 13, 37, 111, 165
Campbell, W. W., 46
Carbonieri, 180
Cardan, 78
Carnochan, 130
Carus, C. G., 63
Cellini, Benvenuto, 81
Chabalier, 229
Chaddock, 42
Chapotot, 4
Charbonnier-Debatty, 40
Charcot, 35, 38
Charpentier, 338
Chassinat, 230
Cherbury, Lord Herbert of, 78
Christian, 23, 25
Chvosteck, 162, 222
Claus, 25
Cloquet, 29
Clouston, 165
Cohen, 4
Colowitsch, 24
Conolly, 33
Cramer, A., 10, 31, 180 *et seq.*, 257, 261, 270
Crichton, 12
Crocq, 40
Curtis, 168
Czerny, 178

DAGONET, 2, 25
Darwin, Erasmus, 19, 112
Daudet, 250
Dee, 66
Dehennes, 4
Delabarre, 175
Delasiauve, 44
Delbœuf, 50
Dendy, 13
Denneux, 40
Despine, 125, 168, 175
Dessoir, 66, 177, 227
Devay, 168
Dewey, 251
Dieffenbach, 45
Dietl, 46
Diez, 26
Dixey, 232
Donatus, 165
Dorvault, 46
Dresslar, 337
Du Bois-Reymond (see Bois-Reymond)
Dufour, 137
Dumontpalier, 195
Duret, 140

EBERS, 225
Edinger, 167
Edgeworth, 274
Ehrhard, 178
Eichel, 169
Elliot, 169
Elschnig, 161
Emminghaus, 33, 44, 120
Engel, 4
Engelhardt, 39
Eppstein, 228
Erlenmeyer, 30, 161
Erk, van, 50
Esquirol, 13, 16, 18, 19, 27, 33, 120. 124, 132, 144, 149, 150, 252
Eulenburg, 153
Ewald, 45

FABIAN, 161
Falk, 9
Falret, 14, 23-27, 32, 115, 325
Farquharson, 9
Fechner, 121, 139, 229, 308
Féré, 129, 149, 200, 219, 222, 229, 231
Ferrier, 19, 113, 150, 165, 168, 170
Feuchtersleben, 34
Ficinus, 97
Fick, 176
Filehne, 169
Fischer, 161
Flechsig, 136, 165
Flemming, 161
Flourens, 134
Flournoy, 228, 338
Forel (Jena), 165, 245, 249, 322
Forel (Zurich), 323
Foster, 130
Fournier, 25, 113
Foville, 25, 112, 165
Franck, François, 12

Franceschi, 9
Frankl-Hochwart, v., 161
Freusberg, 46
Friedländer, 269
Friedmann, 120, 196, 336
Friedreich, 4, 262, 268
Friedrich, J. B., 111
Fröhlich, 179
Fromman, 65
Fuchs, 176
Funke, 183
Fürer, 32, 175, 267

GALEZOWSKY, 4
Gall, 32
Galton, 225
Gauthier, 46
Gelhorn, 25, 26
Giessler, 50
Gilbert, 337
Girma, 25
Gluge, 40, 131
Goethe, 2, 114
Goltz, 157, 181
Gorham, 175
Gowers, 33, 168
Graefe, 3, 160, 161, 170, 174
Grashey, 24, 138, 150, 252, 257
Gratiolet, 246
Gregory, 33, 54
Griesinger, 15, 18, 21, 29-33, 71, 111, 114, 115, 125, 128, 160, 163, 189, 194, 202, 238, 246-247, 252, 325
Griffing, 338
Grohmann, 124
Gruber (Jassy), 224
Gruber, 260
Gruithuisen, 128
Gudden, 12
Guéniot, 10, 11
Guensburg, 42
Guépin, 3
Gurney, 1, 14, 62, 82, 113, 116, 154, 155, 168, 232, 270, 287-288
Gutsch, 157

HAGEN, 16, 23, 25, 33, 118, 122-125, 144, 161, 189, 325
Hall, Stanley, 208
Hammond, 203
Hansen, 318 *et seq.*
Hartmann, 189
Haslam, 24
Hauptmann, G., 253
Hecker, 2
Hedinger, 161
Heimbeck, 9
Heis, 308
Helmholtz, 176, 183, 234
Herbert of Cherbury, Lord, 78
Hering, 130, 183
Herrmann, 56, 131, 183
Herth, 175
Heubner, 140
Heyfelder, 160
Heymans, 5
Hibbert, 13, 311
Higier, 32, 174, 204, 222
Hilbert, 9, 44
Hildebrandt, 50
Himly, 8
Hitzig, 25, 113, 181
Hjertström, 33
Hoche, 201
Hodgson, 104
Hoffmann, 116
Holland, Sir H., 114, 256, 265
Hoppe, 7, 17, 27, 42, 170, 177, 179, 230, 239, 258, 263
Horst, 309
Huck, 3
Hufeland, 9
Hughlings-Jackson, 33, 143
Humboldt, W. v., 189
Hume, David, 121
Huppert, 24
Hutchinson, 222

ITARD, 178

JACKSON (see Hughlings-Jackson)
Jacobs, 176
Jahn, 308
James, Wm., 10, 15, 83, 87, 127, 130, 135, 137, 141 *et seq.*, 173, 219, 220, 232, 251, 262, 275, 288, 304
Jan, 50
Janet, 117, 224
Jendrassik, 231
Jensen, 50, 281
Jessen, 50, 281
Johnson, 165
Jolly, 133, 157, 160, 177, 222
Joseph, 65

Josephus, 308
Judée, Ch., 46
Jung, 26
Jupp, 256

KAAN, 32
Kahlbaum, 115-117, 183
Kandinsky, V., 16, 30, 113, 121, 137, 250-251, 253, 261, 264, 268
Kelp, 85
Kieselbach, 177
Kieser, 20
Kiesewelter, 63
Kirn, 23
Klein, 25
Klinke, 31, 259-260
Knapp, 8
Köhler, 85
Kölle, 24
Köppe, 123, 157, 159, 161
Kohlschütter, 17
Kolk, Schroeder van der, 113, 120, 281
Kraepelin, 22, 30, 31, 44, 48, 71, 72, 117, 147, 278, 280-281, 322
Krafft-Ebing, 21, 22, 24, 27, 29, 30, 32, 33, 39, 42, 114, 116, 125, 175, 204, 247, 249, 278, 322, 325
Krause, 78
Krauss, A., 17, 52
Krauss, Th., 9
Krieger, 169
Krohn, 230
Kühne, 131
Kuykendael, 46
Kussmaul, 44, 182

LADAME, 269
Laehr, 325
Lamoine, 50
Lane, 64
Lang (Gross-Hesselohe), 312
Lange, N., 46
Lange, 72
Langendorff, 157
Langwieser, 264
Lanne, 162
Lazarus, 133, 197
Leber, 4
Lefebvre, 40
Legué, 37
Lehert, 166
Lehmann, 229, 317 *et seq.*
Leland, 70
Lélut, 14, 28, 77, 111
Lemoine, 50
Lepsius, 225
Leubuscher, 111, 120, 163, 202
Leuret, 2, 14, 111, 252
Levinstein, 4
Lewin, 8
Linstow, 25
Lipps, 5, 340
Lissauer, K., 4
Lissauer, 135
Locher-Zwingli, 161
Lochus, 3
Lockemann, 180
Lombroso, 77, 126, 199
Londe, 21
Longet, 134
Lotze, 189
Lowell, J. R., 282
Lucae, 178, 179
Lussana, 202
Luys, 27, 113, 165, 168

MABILLE, 174
Macario, 112
Maccabees, 308
Mach, 8
Macnish, 50
Magnan, 43, 175, 194
Magne, 160
Manonry, 80
Marandon de Montyel, 23
Marc, 28
Mari, 9
Marillier, L., 83, 87, 276, 359
Martin, A., 9
Martini, De, 9
Maury, 17, 50, 51, 53, 57, 143
Mauthner, v., 9
Mayer, A., 17, 46
Menardière, Pilet de la, 37
Mendel, 21, 23, 25, 26, 48, 150, 161, 166
Mendoza, F. Suarez de, 230
Mercurialis, 178
Meschede, 165, 180
Meyer, 3
Meyer, G. H., 129
Meyer, L., 2, 26, 33, 120
Meynert, 23, 113, 121, 138, 140 *et seq.*, 177, 181

Michéa, 2, 13, 17, 20, 27, 30, 32-34, 38, 165, 202, 323
Michel, 28, 265
Mickle, 25, 26, 165
Mitchell, Weir, 10, 12, 239
Möller, 114
Moll, 19, 59, 92, 205 *et seq.*, 209, 218, 231, 245, 285, 326
Monakow, 12, 126, 132
Moos, 178
Morel, 17, 25, 159, 180
Moreau (de Tours), 13, 20, 38, 45, 46, 143, 263
Morselli, 335
Mourly-Vold, 50, 55, 247
Moxon, 9
Müller, 338
Müller, C. F., 56
Müller, F. C., 48
Müller, Fr., 130
Müller, J., 16, 110, 114, 159, 165, 169, 192
Münsterberg, 142, 145, 198
Munk, 113, 134, 135, 181
Myers, 63, 66, 70, 77, 116, 227, 262

NANCY SCHOOL, 196
Naunyn, 269
Neiglick, 229
Nelson, 300
Neumann, 111, 120, 150, 281
Newton, 169
Nicolai, 256
Nothnagel, 268, 269
Nussbaumer, 229

OBERMEYER, 26
Obersteiner, 26
Ochorowicz, 61
Ottolenghi, 126
Ottway, 309

PAGET, 33
Paracelsus, 70
Parant, 265
Paré, 10
Parinaud, 199
Paterson, 128, 166
Pelman, 137
Perrond, 229
Perty, 41, 75, 77, 310, 311
Pfaff, 188
Pflüger, 153
Philippe, 249
Pick, 136, 200, 202, 265, 269
Pico della Mirandola, 65
Pierson, 269
Picraccini, 203
Pierce, 287
Piesse, 38
Pilet de la Menardière, 37
Plater, 19, 178
Plato, 77, 190
Plutarch, 80
Podmore, 274, 315
Poe, E. A., 303
Pohl, 120
Politzer, 164, 186
Pollnow, 179
Polli, 45
Pooley, 168
Popp, 44
Pratt, 306
Prel, Du, 11, 67
Preyer, 46, 153, 176, 182
Procopius, 80
Prosper-Alpin, 41
Pupke, 4
Purkinje, 50, 55, 169

QUADRI, 179
Quincey, De, 46

RADESTOCK, 15, 41, 50, 56, 188, 189, 211, 246
Rause, F. de, 230
Rawlinson, 242
Rech, 46
Régis, 25, 44, 175
Reil, 120, 202
Reinhard, 165
Rells, 63, 210
Reubold, 52
Richer, 35-38, 45
Richet, 272
Richter, 164
Rieger, 181
Ringer, Sidney, 85
Ringier, 61
Rist, 66
Ritti, 25, 113
Rizet, 10

Robertson, Alex., 32
Roger, 269
Romberg, 123, 165
Rose, 9, 32
Rosenbach, 254
Rosenbaum, 153
Royce, 277
Rudolphi, 124
Ruf, 159

SANDER, 3, 23, 25, 33, 166, 180, 246, 281
Sandras, 114
Saury, 26
Sauvage, 19, 169
Savage, 29, 54, 174, 211
Schaller, 120
Schech, 56
Scherner, 50, 52
Schiff, 134
Schiller, 193
Schirmer, 167
Schlager, 29, 132
Schleiermacher, 48
Schmiedekam, 179
Schmidt-Rimpler, 160
Scholz, 164, 173
Schönthal, 30
Schrader, 134
Schrenck-Notzing, 29, 35, 41, 45, 83, 187, 196, 246, 344 (App. I.), 359
Schröder, 4
Schroeder van der Kolk (see Kolk)
Schroff, 46
Schüle, 16, 25, 110, 121, 124, 125, 165, 203
Schunk, 33
Schwabach, 179
Schwarze, 177, 173
Schwann, 131
Searle, 244
Seashore, 191, 377 *et seq.*
Seemann, 41
Séglas, 21, 32, 264
Sémal, 40
Sepilli, 203
Séquin, 128
Sergi, 126
Sérieux, 269
Sichel, 160
Sidgwick, 82, 359
Sidgwick, Mrs., 232, 293, 320
Siebeck, 50
Siebert, 50
Siemens, F., 157
Simon, 25
Simon, M., 159
Simonowitsch, 203
Sims, 287
Sinogovitz, 158, 174
Snell, 22
Sommer, 320
Souchon, 32, 175
Sous, G., 161
Spencer, 44
Spitta, 38, 44, 50, 51, 52, 57-59, 70, 189
Stauffer, 12
Steinbrügge, 229-230
Stellwag, von Carion, 4
Stenger, 165
Stinde, Jul., 230
Strahl, M., 56
Stricker, 121, 133, 137, 182
Strong, 191
Strümpell, 50
Stucki, Peter, 75
Studer, 310
Suarez de Mendoza (see Mendoza), 230
Sully, 4, 54
Swieten, Van, 9
Syzianko, 177
Szafkowski, 14, 33, 325

TACITUS, 79
Taine, 16, 118, 143
Talma, 81
Tamburini, 125, 167-168
Tasso, 81
Tavignot, 160
Thomas Aquinas, 65
Thomeuf, 24
Thomsen, 41
Thore, 26, 30, 49, 85
Tigges, 127, 166, 168, 201, 203
Tomaschevsky, 203
Toulouse, 32
Truchsess, 42

UHTHOFF, 174
Ulrici, 189
Unterharnscheid, 4
Urbantschitsch, 178, 203, 229

VALENTIN, 10, 179
Vay, A. v., 246
Verga, Andr., 1, 32
Virchow, 139
Vogt, 323-4
Vould, J. Mourly-, 50, 55, 247
Voisin, 25, 175
Volkelt, 50
Volkmann v. Volkmar, 234
Volta, 170
Vulpian, 131

WAGNER, 50
Walker, 309
Warlomont, 40
Weber, 43
Weiss, 21, 23
Weisse, 29
Wernicke, 269
Westphal, 2, 3, 25
Weigandt, 50, 53, 54, 55, 57
Wigan, 281
Wijsmann, 120
Willbrandt, 135
Wille, 268
Winslow, 167
Wittich, 8
Wolf, 8
Wolff, 42
Wundt, 128, 140, 154, 183, 206 *et seq.*, 212, 216, 236, 237, 318
Wyss, 203, 210

X. (Miss), 297
Xenophon, 77

ZANDER, 163
Zehender, 160
Ziehen, 31, 179, 184, 227, 262, 266, 322
Ziemssen, 25

INDEX OF SUBJECTS.

ABDOMEN, voices heard from, 2, 260, 265
Absinth, 43
Accelerated association, 322
After-images, 8, 96, 128-130, 173, 175, 197, 243, 248; auditory, 176, 259
Age, influence of, on hallucinations, 84, 189
Alcohol, 34, 41, 43, 71
Ambiguous stimuli, 5
Amentia, 21
Amnesia, 92 (see Forgetfulness)
Anæmia, 153
Anæsthesia, 6, 211
Analgesia, 211, 216
Anxiety, 96, 191, 302, 316
Aphasia, 127, 265
Apparitions at death, 272, 286; in sky, 308-309
Association, disturbed, 138, 141, 322 (see Dissociation); enforced, 219, 336; obstructed, 65, 71-73, 158, 322; of ideas, 68, 72, 257, 290-291, 300, 302, 305; of ideas, dreams from, 50, 51
Atropin, 7, 44, 70, 202
Attention, 154, 192, 216, 217; in *rapport*, 205, 206, 208, 209, 213, 214, 218
Attila, 79
"Audible thinking," 24, 182, 184, 252, 256, 258, 259, 262, 265, 266
Auditory hallucinations, see Hallucinations, auditory
Audition colorée (sound-seeing), 223, 227
Aura, epileptic, 33, 100; hysterical, 35; preceding "sensory shock," 239
Automatic articulation, 155, 259, 261-263, 270, 322
Automatic writing, 154, 156, 261-263

BELLADONNA, 44
Blind, so-called "visual" hallucinations in the, 186, 222, 246
Borderland hallucinations, 91, 299
Bright's disease, 173
Brocken spectre, 3
Byron, 81

CATARACT, 160
Catoptromancy (divination by mirror), 65
Census of hallucinations, American, 83, 275; English, 82, 87, 237, 275; Munich, 83, 275; French, 83, 87, 276
Centres of sensation and imagination identical, 133-136
Centrifugal theories, 113, 125
Centripetal theories, 132
Charles IX., 80
Chattering, spasmodic, 262, 268
Chorea, see Epidemic of dancing
Chloroform intoxication, 44
Chromatisms, 223, 224; phonetic, measurement of, 224-227
Cinchona, 46
Clairvoyance, 273
Closing the eyes, action of, on hallucinations, 202-203
Coca, 34, 40
Coincidental hallucinations, see Hallucinations, coincidental

Collective hallucinations, see Hallucinations, collective
Colour, associated with sound, see *Audition colorée*
Colour-blindness, 163
Colouring of hallucinations, degrees of realism in, 246
Consciousness, dissociation of, see Dissociation
Consciousness of lost limbs, 10-12
Continued dreams, 60, 61
Continued movements, 268
Complementary colours, 130, 199 (see After-images)
Cramp (Kahlbaum), 183; co-ordinated (Romberg), 123; of the sensory nerves (Hagen), 123; of recognition (Royce), 277; of attention (Stanley Hall), 208
Crime caused by hallucinations, 34
Cromwell, 79
Crystal-visions, 63-70, 72, 193, 274, 297; indications of dream-state in, 297, 298; latent memories revived in, 66-69; "telepathic," 66, 297
Curtius Rufus, 79

DATURA STRAMONIUM, 44, 178
Deaf-mutes, "auditory" hallucinations in, 185
Defects of human organism a cause of hallucination, 6
Delusions mental, distinguished from sense-deceptions, 1
Delusional insanity, 23
Delirium tremens, 42, 174
Dementia, 23; acute, 21; advanced, 25; progressive, 27
Dæmoniacal possession, 37
Dæmonology, 56
Dentists, unfounded charges brought against, 46; hallucinations of pain noted by, 240
Descartes, 78
Devil, see Hallucinations of
Diplopia, 3
Divination by crystals, mirrors, etc., 63, 65
Doubling of hallucination by pressure on eye, 200-202; by prism, see Prism
Disappearance of hallucinations on closing eyes, 202, 203
Dissociation of consciousness, 71, 75, 92, 93, 99, 103, 106, 138, 141, 147, 148, 152, 153, 211; induced by automatic movements, fixed gazing, etc., 96, 99; degrees of, 73, 156, 158, 324; partial, 322, 324; sense of time lost in, 100, 105
Dreams, 30, 50 etc., 59, 109, 157, 192; artificially induced, 57; caused by association of ideas (Spitta), 50, 51; caused by nerve-stimulation (Spitta), 50, 51, 52, 53, 102; hypnotic, 59; hypnotic, guidance of, 60; sense of unreality in, 254
Dream-state, 50, 292, 298 (see Dissociation)
Drusus, 79

EAR disease, 161, 263, 267-268
Early theories of hallucination, 110
Eccentric projection, 9, 115, 125, 127, 248
Ecstasy, 38, 39, 40, 211
Elementary sensations, see Noises in ear, ocular spectra, etc.
Entoptic phenomena, see Ocular spectra
Entotic sounds, see Noises in ear
Epidemic of dancing, 36, 37
Epidemic hallucinations, see Hallucinations, epidemic
Epilepsy, 33, 34, 74, 143, 167, 180, 195
Epileptic aura, see Aura, epileptic
Ether, 44, 187, 267
Euphoria, 38, 50
Exhaustion, 35 (see Fatigue); of brain-elements, 153, 192
Expectancy, 94, 95

FAINTING from terror, 99
Fallacious perception, physiological process in, 144; psychological conception of, 12, 17; sensory character of, 112, 322 (see Hallucination)
Faradisation, 12
Fata morgana, 3
Fatigue, 6, 7, 239

Fever-delirium, 49, 74, 237
Fixed attention, 154, 213, 216, 217
Fixed gaze, 95, 99
Fixed ideas, 27, 38
Fly agaric, 40, 44
Folie circulaire, 22, 267
Forgetfulness, 108, 289, 299
Fox, G., 79

GALVANISM, effect on auditory sense, 162, 176, 177, 222
Gastromancy, 65
General paralysis, 24, 26, 28, 73
Giddiness, 7 (see Vertigo)
Gigantic apparitions, 44, 79, 93, 202
Greek idea of soul, 246
Grief, 96

HALLUCINATIONS—
auditory, 23, 24, 30, 35, 44, 46, 49, 107, 108, 114, 157, 161, 178, 188, 195, 222, 238, 263
auditory, in brain lesions, 268-269
auditory, in disease of ear, 267-268
auditory, in deaf mutes, 185
auditory, in electrical stimulation, 222
auditory, experimental, 70, 71,
auditory, in paranoia hallucinatoria, 23
auditory, rhythmic, 266, 267
auditory, see "Audible Thinking," Voices, etc.
of artists, 38, 80, 81
"borderland," 90, 299
coincidental, 103, 272, 286-288, 293-298, 315
collective, 94, 307, 313, 316
a cause of crime, 34
of childhood, 30, 85
of the cutaneous sensibility, 29, 54
definition of, 15
differences of character in, 73
degrees of externalisation in, 236, 237, 238-248
distorted, 202
of devil, 33, 36, 37, 39, 80, 190
early accounts of, 77-80
enlarged, see Magnifying-glass
preceding epilepsy, 100
epidemic, 190, 308, 310-313
erotic, 35, 44, 46, 48

Hallucinations—*Continued.*
induced by exposure and fatigue, 6, 7, 74, 75
in hemianopsy, 128, 134, 136, 202
heredity in, 72, 88, 89
in hemianæsthesia, 35
hypnagogic, 74, 93, 94, 117, 119, 157, 295, 297
in hypnosis, 58, 60, 61, 195, 198, 248, 249, 285, 300
in hysteria, 34-36, 72, 164
and illusion, author's definition, 148, 149
and illusion, Esquirol's distinction, 18, 19, 20
of insanity, 16, 20, 27, 29, 183, 322
international census of, see Census
of intoxication, 41 (see Alcohol)
of more than one sense, 31, 107, 110, 237
of the muscular sense, 29, 180, 183, 184
of moving objects, 35, 128, 129, 233
of memory, 117, 230, 277, 323
negative, 20, 203-207, 212, 214, 215, 217-219, 326
olfactory, 27, 28, 46, 49, 53, 54, 62, 179, 180, 229, 239, 241
of the organic sense, 29
of pain, 240
post-hypnotic, 61, 62, 72, 323
in psychoneurosis, 32, 33
reflected, see Crystal-visions, Mirror
religious, 38, 39, 77-80, 312
rudimentary, 108, 110, 111, 123
retroactive, 285
in somatic disease, 48, 49
sporadic, in the sane, 20, 278
of taste, 27, 28, 49, 241
tactile, 28, 35, 62, 105, 107, 108
unilateral, 32, 123, 128, 164, 174, 195
visual, 30, 35, 107, 108, 197, 222-230, 241; visual, voluntarily induced, 194 (see Crystal-visions, Visions, etc.)
Hallucinatory colours, 200; conversations, 265-266
Haschisch, 40, 45, 48, 187
Health, 88
Hemiopia, 166
Heredity, 72, 88; in synæsthesia, 229

Hobbes, 78
Hydromancy (divination by water), 65
Hyperæsthesia, 27, 133, 141, 167, 208; of retina, 8, 177, 239, 260, 267
Hypnotism, see Hallucinations in hypnosis; also *Rapport;* its services to psychology, and Nancy School
Hypochondriasis, 2, 25
Hysteria, see Hallucinations in

ICTERUS, 8
"Identifying" fallacy (Kraepelin), 280
Identity, mistakes of, 83, 193, 291; of sensory and ideational centres, 133-136
Idiopathic and symptomatic hallucinations, 20
Illusions, 257
Illusions (in Esquirol's sense), 18, 20, 234, 237, 291, 326; (author's definition), 148, 149
Inanition, 72, 160
Individual or idiosyncratic fallacies of perception, 12, 336
Inhibition, 141, 152
Insanity, hallucinations of, see Hallucinations of insanity
Integritätsgefühl (feeling of spiritual unity, Du Prel), 11
Intra-aural sounds, see Noises in the ear
Involuntary speaking, 182, 183 (see "Audible thinking")
Involuntary whispering in telepathic experiments, 318

JOAN OF ARC, 39
Julian the Apostate, 65, 79

LEAD-POISONING, 44
Lecanomancy, 65
Light-chaos or light-dust, 168, 169
Localisation theories, 137
Loyola, 79
Luther, 79

MACROPTIC vision, 202
Magnifying-glass, hallucinations enlarged by, 69, 150, 231, 232
Mania, 22, 71, 73
Marie de Moerl, 39
Melancholia attonita, 21, 211
Memory, delusions or fallacies of, 104, 105, 106, 283, 316; hallucinations of, see Hallucinations of memory; loss of, see Amnesia; memory-spasms (Friedreich), 262, 268; memories revived in dreams and crystal-visions, 51, 66
Meningitis, 163, 167
Mental and sensory delusions distinguished, 1, 2
Mercury-poisoning, 44
Microscope, 118
Mirage, 308
Mirror reflecting hallucination, 95, 150, 200, 231, 232, 296, 298
Mirror-writing, 67, 262
Misreading of words (Münsterberg's experiments), 198
Montana, 80
Mutism, 184
Myopia, 163

NANCY SCHOOL of Hypnotism, 196
Nationality in hallucination, 85
Negative hallucinations, 20, 203, 204, 205, 206, 207, 212, 214, 215, 217, 218, 219, 326
Neurasthenia, 32
Neuritis optica, 164, 174
Nicotine poisoning, 169, 239
Nightmare, 56
Nitrous oxide, 46
Noises in the ear, 177-178, 258, 267
Number habit, 318
Nystagmus, 202

Objectivation des types, 60
Ocular spectra, 159, 170
Olfactory hallucinations, see Hallucinations, olfactory
Onychomancy, 65
Opium, 34, 40, 46, 48, 187
Optic nerve, degeneration of, 165
Optical paradoxes, 5, 340
Organic or common sensation, 6, 29, 55, 157, 158, 187
Ovarian disease, 29
Over-work, 95

PARALYSIS, 26, 28, 73, 166
Paranoia, 23, 62
Paræsthesia, 6, 25, 29
Pascal, 78
Pathological states, hallucinations in, 6, 8, etc.
Peritonitis, 2
Perceptions, objective and subjective, distinguished, 1
"Phantasticon" (Joh. Müller), 114
Point de repère (Binet), 149, 213, 220, 231, 232, 233; new conception of, 235, 314
Poisons as a cause of dissociation, 153; narcotics, etc., specific action of, 46, 47
Post-hypnotic hallucinations, see Hallucinations, post-hypnotic
Pressure on the eye-ball, 170, 200, 201
Prism, experiments with, 130, 150, 200, 231, 232
Pseudo-hallucinations, 249
Pseudo-recognition, 277
Psychic blindness, 215, 216
"Psychic elements," 326, 329
Psychical Research, Society for, 82, 273, 292

RAPHAEL, 80
Rapport, 204-212
Reading, prolonged, 98
Reflex hallucinations (Kahlbaum), 117
Reflex sensations, see Synæsthesia
"Refluent" nerve-currents, 125, 126, 131
Reproduction, organs of, 29
"Retinal action" in hallucination, 125, 128, 130, 199-202
Retroactive hallucinations, 285
Reverberation of impression, 7
Rudimentary hallucinations, see Hallucinations, rudimentary

SAINTS, hallucinations of, 32, 39, 325
Salpêtrière School of hypnotism, 196
Santonin, 8, 46
Savonarola, 78
Scheme of physiological process in false perception, 144
Schumann, 81, 338
Scott, W., 81
Selection, involuntary, in Census Inquiry, 288
Self-suggestion in hypnosis, 208
Sensory and mental delusions distinguished, 1, 2
Septimius Severus, 65
Severn, Mrs., 240
Sex in hallucination, 83, 184
Shell-hearing, 70
Signes réducteurs (Taine), 118
Smell, hallucinations of, see Hallucinations, olfactory
Socrates, 77
Solitude, 96-157
Somnambulism, 34
Sound-seeing, see *Audition colorée*
Spasm of apperception (Royce), 277
Spasmodic chattering, 262, 268
"Speaking with tongues," 262
Starting factor in hallucination, 231
Subliminal consciousness, 66, 70
Subconscious ideas, 51, 194
Suggesting factor in hallucination, 231
Suggestion, 26, 94 (see *Rapport*); "retinal action" accounted for by, 199
Swedenborg, 39
Synæsthesia, 221, 228, 229

TABES, 2
Telepathic hallucinations, 272-292, 316; experimental, 241, 317
Telepathic crystal-visions, 66; impression, definition of, 274
Telepathy, 76, 190, 201, 241, 272, 274, 301, 313, 317, 320, 335
Temperament, 188
Terror, 34, 45, 250, 251
Theodoric, 80
Thought-transference, 317 (see Telepathy)
Tobacco, 169, 239
"Training" in hypnotic subject, 220
"Transferred" sensations, 241
Tumours in the brain, 167, 174, 180
Typhoid fever, 8
Typhus-delirium, 34, 49

UNILATERAL hallucinations, see Hallucinations, unilateral
Universal fallacies of perceptions, 3, 336, 337, 341

VERMIN, reptiles, etc., hallucinations of, 35, 41, 42, 43
Veridical hallucinations, 230, 272, etc.
Vertigo, 44, 261
Visions, 38, 39, 79, 80, 188, 189
Visual hallucinations, see Hallucinations, visual, Visions, Crystal visions, etc.
Voices, heard by insane, 2, 24, 32, 182, 238, 260, 265; in delirium tremens, 43; in fever delirium, 49

WAKING hallucinations, 76, 77, 82, 83, 287, 300; international census of, 82 *et seq.*, 109, 242, 275, 287
Weight, hallucinations of, 337-340
Whispering, dreams produced by, 58; whispering, unconscious, in telepathic experiments, 318
Witches and witchcraft, 36, 37, 56, 80, 190
Witches' salves and philtres, 41

XANTHOPSIA (yellow vision), 8

ZOETROPE, 7
Zigzag figure in migraine, 173

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